Project No. 1251-100
Crude Oil Tank Farms Project, Agrood Area 30 (Module-1)

PETROJET · Enppi · EGPC

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
1	**Mechanical Completion Certificate (MCC)**	
2	**Ready for Startup Certificate (RFSU)**	
3	**System Punch Lists**	
4	**System Limits Marked Up P&ID**	
5	**System Index**	
6	**Piping Pre-Commissioning**	
	6.01) Piping Test Packs	
	6.02) Piping Pre-commissioning Check Lists	
7	**Piping Commissioning**	
	7.01) Service Test, GLT, CLT and N2 Purging Certificates	
	7.02) Piping Commissioning Check Lists	

Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
8	**Mechanical Pre-Commissioning**	
	8.01) System Mechanical Index	
	8.02) Equipment Drawings	
	8.03) Equipment Datasheets	
	8.04) Boxing-up Certificates	

	8.05) Grouting Certificates	
	8.06) Pre-Alignment Certificates	
	8.07) Mechanical Pre-Commissioning Checklists	
9	**Mechanical Commissioning**	
	9.01) Final Alignment Certificates	
	9.02) Motor Solo Run Certificates	
	9.03) Mechanical Run Test (MRT) Certificates	
	9.04) Mechanical Commissioning Checklists	
	9.05) Mechanical Supplier Check Lists & Reports	
10	**Instrumentation Pre-Commissioning**	
	10.01) System Instrument Index	
	10.02) Instrument Data Sheets	
	10.03) Instrument Cable Schedule	
	10.04) System Instrumentation Wiring Diagram	
	10.05) Hook-up Drawing (Mechanical & Pneumatic)	
	10.06) Instruments Cables Schedule	
	10.07) Instruments Cables Laying Certificates	
	10.08) Instruments Cables Termination Certificates	
	10.09) Instruments Cables Testing Certificates	
	10.10) Instruments Calibration Certificates	
	10.11) Instrument Loop Checks Certificates	
	10.12) Instrumentation Pre-Commissioning Check Lists	
	10.13) Instrumentation Supplier Check Lists & Reports	
11	**Instrumentation Commissioning**	
	11.01) Instrumentation Function Test Certificates	
	11.02) Instrumentation Supplier Check Lists & Reports	
Sr.	**Pre-Commissioning and Commissioning Dossier Index**	**Applicable (Yes/No)**
12	**Electrical Pre-Commissioning**	
	12.01) System Electrical Index	
	12.02) Electrical Drawings	
	12.03) Motor Datasheets	
	12.04) Electrical Cables Schedule	
	12.05) Electrical Cables Laying Certificates	
	12.06) Electrical Cables Testing Certificates	
	12.07) Electrical Cables Termination Certificates	
	12.08) FAT Reports & Certificates	
	12.09) SAT Reports & Certificates	
	12.10) Electrical Pre-Commissioning Check Lists	
	12.11) Electrical Supplier Check Lists & Reports	

13	**Electrical Commissioning**	
	13.01) Electrical -Commissioning Check Lists	
	13.02) Electrical Supplier Check Lists & Reports	
14	**Red Marked-up Drawings**	
	14.01) P&ID	
	14.02) Instrumentation Drawings	
	14.03) Electrical Drawings	

Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

Pre-commissioning and Commissioning Dossier Content:

Section	Description		Status
1-	Mechanical Completion Certificate (MCC) Ready For Start-up (RFSU)		
2-	System Punch Lists		
3-	System Limits Marked Up		
4-	FAT Test Report & Certificates		
5-	System Index.		
6.A-	Electrical Pre-commissioning		
	6.A.1	General Arrangement and Wiring Diagrams	
	6.A.2	Single line Diagram	
	6.A.3	Electrical Panel Schedule	
	6.A.4	Electrical Cable Schedule	
	6.A.5	Pre-Commissioning Check List	
6.B-	Electrical Commissioning		
	6.B.1	Commissioning Check List	
7-	Red Mark-Up Drawings (If Any)		

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

1-Mechanical Completion Certificate (MCC)

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SYSTEM MECHANICAL COMPLETION CERTIFICATE (MCC)

PROJECT TITLE	:	CRUDE OIL TANK FARM PROJECT (AGROOD AREA)
PROJECT No	:	01251-100
SYSTEM NAME	:	Tank-01 Cathodic Protection System
SYSTEM ID	:	030-CP-002

THIS IS TO CERTIFY THAT:

- **THE ABOVE SYSTEM HAS BEEN FABRICATED, ERECTED, INSTALLED AND TESTED TO THE REQUIREMENTS OF THE CONTRACT DRAWINGS, SPECIFICATIONS, THE APPLICABLE CODES AND STANDARDS.**
- **ALL PRE-COMMISSIONING RELEVANT ACTIVITIES, TESTS, INSPECTIONS AND CHECKS HAVE BEEN CARRIED OUT FOR THIS SYSTEM AND FOUND ACCEPTABLE.**
- **Q/C DOCUMENTATION OF THE ABOVE SYSTEM HAS BEEN AUDITED BY THE CUSTOMER SITE QUALITY CONTROL AND FOUND COMPLETED.**
- **ALL PUNCH LIST ITEMS CATEGORY (A) IN THIS SUBSYSTEM WERE CLEARED.**
- **THIS SYTEM IS MECHANICALLY COMPLETED ON THE DATE AND READY FOR COMMISSIONING (RFC) WITH THE FOLLOWING EXCEPTIONS.**

EXCEPTIONS :

COMPANY	PETROJET	ENPPI	PMC
NAME	Sabry Sedeen	For/ Abdullah Fathy	
TITLE	QC E&I engineer	Const. Engineer	
SIGNATURE	[signature]	[signature]	[signature]
DATE	1-8-2021	1-8-2021	

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

2- Ready for Startup Certificate (RFSU)

PETROJET Enppi EGPC

READY FOR START UP CERTIFICATE

PROJECT TITLE	: EGPC CRUDE OIL TANK FARMS PROJECT (AGROOD-30)
PROJECT No.	: 1251-100
SYSTEM /AREA /PLANT	: Tank-01 Cathodic Protection System
SYSTEM /AREA /PLANT No.	: 030-CP-002

THIS IS TO CERTIFY THAT:

- THE MENTIONED SYSTEM /AREA /PLANT IS READY FOR START UP WHERE ALL MECHANICAL WORKS, PRECOMMISSIONING AND COMMISSIONING ACTIVITIES HAVE BEEN SUCCESSFULLY COMPLETED.
- MECHANICAL COMPLETION CERTIFICATE(S) FOR THE MENTIONED SYSTEM / AREA / PLANT HAVE BEEN SIGNED.
- ISSUANCE OF THIS READY FOR START UP CERTIFICATE(S) SHALL NOT RELIEVE CONTRACTOR(S) FROM THEIR OBLIGATIONS TO COMPLETE THE REMAINING SYSTEMS NOR FROM THEIR WARRANTY OBLIGATIONS AND OTHER PROVISIONS OF THE CONTRACT.
- THE FOLLOWING EXCEPTIONS AGREED TO BE CLEARED AFTER START UP AND WILL NOT PREVENT START UP ACTIVITIES.

EXCEPTIONS :

COMPANY	CONSORTIUM	PPC
NAME	Sobhy Seleem	Mohamed Ibrahim
TITLE	QC E&I engineer	Electrical engineering
SIGNATURE	[signature]	[signature]
DATE	29/8/2021	29/8/2021

10000-000-EK8-FRM-0006 (03/15)

3- System Punch Lists

PETROJET | Enppi | **PUNCH LIST** | EGPC

PROJECT TITLE : CRUDE OIL TANK FARM PROJECT (AGROOD AREA)

PROJECT NUMBER : 01251-100 — **DISCIPLINE:** process

SYSTEM NAME: Tank-01 Cathodic Protection System — **SYSTEM ID:** 030-CP-002

SUB-SYSTEM NAME: — **SUB-SYSTEM ID:**

NO	DESCRIPTION	CAT	ACTION BY	DISP	CLEARANCE APPROVED BY	
	No Punch					[signature]

CAT: CATEGORY(A,B,C) ,ACTION BY: (ENPPI,CONST.CONTRACTOR,SUPPLIER.....) , DISP: DESCIPLINE(PIP,MECH,ELECT,INST.......)

COMPANY	PTJ	ENPPI	PMC
NAME	[signature]		
SIGN.			[signature]
DATE			

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

4- System Limits Marked Up P&ID

5- System Index

6- Piping Pre-Commissioning

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

6.01- Piping Test Packs

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

6.02- Piping Pre-commissioning Check Lists

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

7- Piping Commissioning

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

7.01- Service Test, GLT, CLT and N2 Purging Certificates

7.02- Piping Commissioning Check Lists

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

8- Mechanical pre-Commissioning

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

8.01- System Mechanical Index

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

8.02- Equipment Drawings

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

8.03- Equipment Datasheets

Enppi PETROJET	Project: 01251-100 CRUDE OIL TANK FARM PROJECT (AGROOD AREA)	Petroleum Pipelines Company شركة أنابيب البترول

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

8.04- Boxing-up Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

8.05- Grouting Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

8.06- Pre-Alignment Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

8.07- Mechanical Pre-Commissioning Checklists

9- Mechanical Commissioning

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

9.01- Final Alignment Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

9.02- Motor Solo Run Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

9.03- Mechanical Run Test (MRT) Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

9.04- Mechanical Commissioning Checklists

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

9.05- Mechanical Supplier Check Lists & Reports

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10- Instrumentation Pre-Commissioning

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.01- System Instrument Index

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.02- Instrument Data Sheets

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.03- Instrument Cable Schedule

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.04- System Instrumentation Wiring Diagram

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.05- Hook-up Drawing (Mechanical & Pneumatic)

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.06- Instruments Cables Schedule

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.07- Instruments Cables Laying Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.08- Instruments Cables Termination Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.09- Instruments Cables Testing Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.10- Instruments Calibration Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.11- Instrument Loop Checks Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.12- Instrumentation Pre-Commissioning Check Lists

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

10.13- Instrumentation Supplier Check Lists & Reports

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

11- Instrumentation Commissioning

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

11.01) Instrumentation Function Test Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

11.02- Instrumentation Supplier Check Lists & Reports

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12- Electrical Pre-Commissioning

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.01- System Electrical Index

			Tag Number	Tag Description	Form Type	Check Forms ID	Remarks
030-CP-002	Tank-01 Cathodic Protection System	Cathodic Protection	EPC BY PTJ	EPC BY PTJ	N/A	EPC BY PTJ	

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.02- Electrical Drawings

Enppi

SUPPLIER'S DOCUMENT COVER PAGE (FOR A4/A3 DOCUMENTS ONLY)

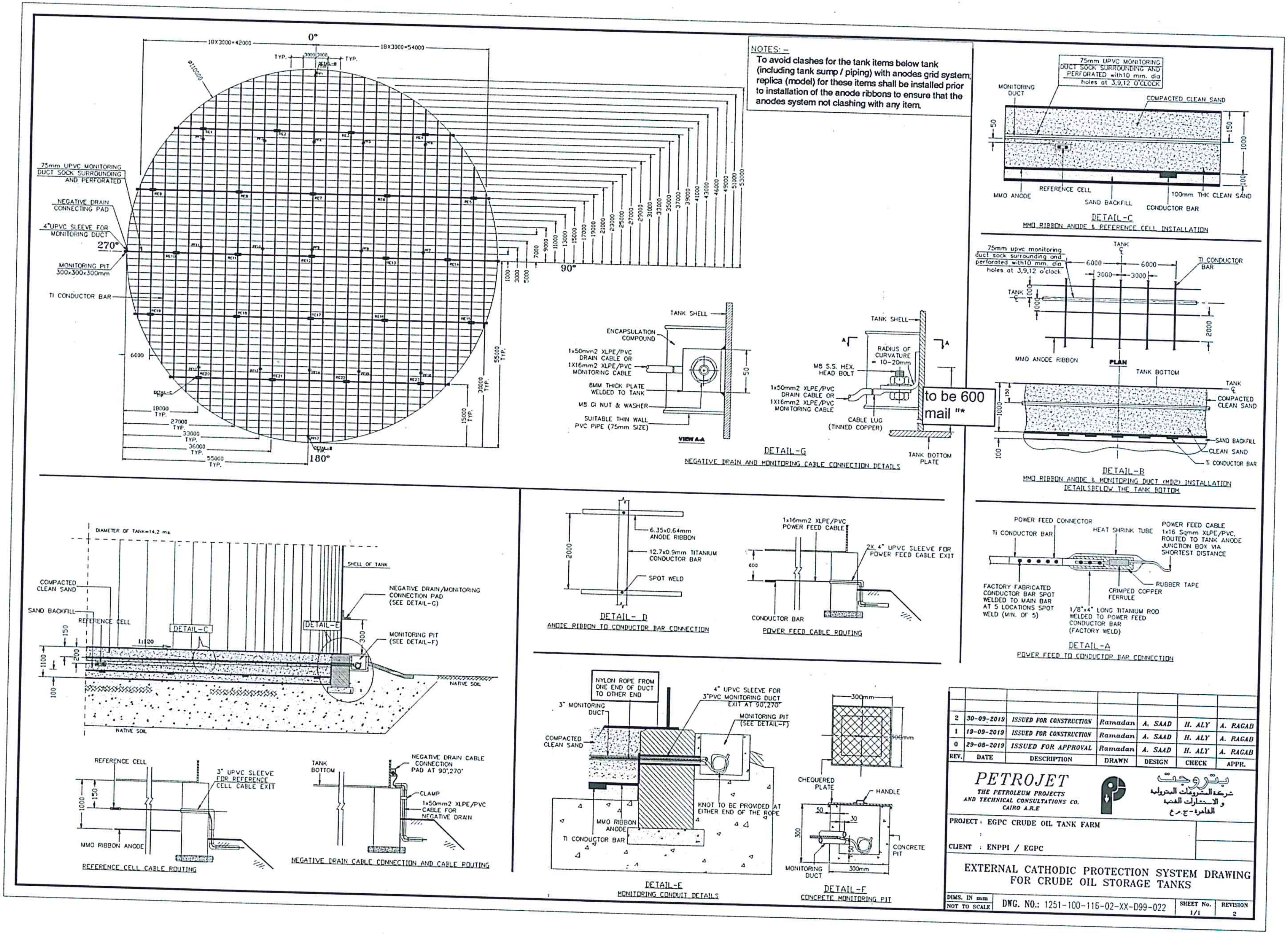
SUPPLIER'S NAME :	Petrojet
PURCHASE ORDER No :	01251-100-116-2-Q
DOCUMENT TITLE :	External Cathodic Protection system drawing for Crude Oil Storage Tanks
TOTAL No OF PAGES :	Cover +1
SUPLLIER'S ORDER No :	

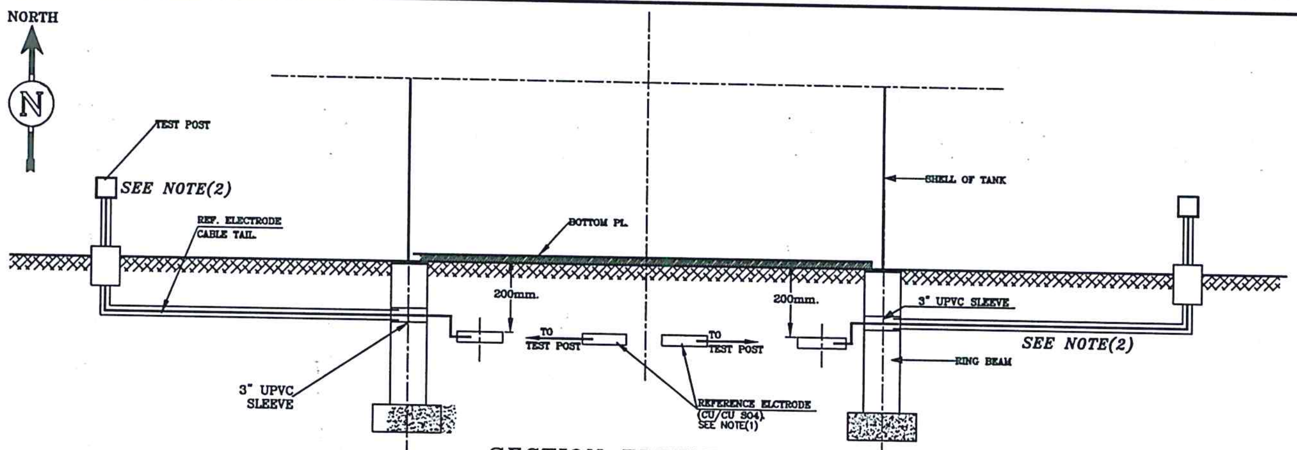
SUPPLIER'S OWN DOCUMENT No	SUPPLIER'S REVISION	DATE	SUPPLIER APPROVAL SIGNATURE
2019/CRUDE OIL-ALL TANKS-30-D-3-CP-01	0	010., 9, 2019	Magdy
	1	18/9/2019	Magdy
	2	30/9/2019	Magdy

SUPPLIER DOCUMENT REVIEW		
PERMISSION TO PROCEED DOES NOT CONSTITUTE ACCEPTANCE OR APPROVAL OF DESIGN DETAILS, CALCULATIONS, ANALYSIS, TEST METHODS OR MATERIALS DEVELOPED OR SELECTED BY SUPPLIER FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.	PROJECT TITLE	EGPC Crude Oil Tank FARM
	ENPPI PROJECT NUMBER	01251-100
	PACKAGE DESCRIPTION	Crude Oil Storage Tank
■ 1. WORK MAY PROCEED.	EQUIPMENT TAG	XX-T-01/2/3/4 -All Tank
○ 2. REVISE AND RESUBMIT IN ACCORDANCE WITH COMMENTS, WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED.	CODE IDENTIFIER	D99
○ 3. REVISE AND RESUBMIT, (MAJOR COMMENTS) WORK MAY NOT PROCEED.	DOCUMENT NUMBER	REV
○ 4. REJECTED, (REASON TO BE SPECIFIED ON THE DOCUMENT).	1251-100-116-02-XX-D99-022	2
○ 5. HOLD FOR A SPECIFIC REASON (TO BE SPECIFIED ON THE DOCUMENT).		
NAME: *Ahmed Kamal Abu ElMagd*		
SIGNATURE: A. [signature] — DATE : *Oct. 01, 2019*		

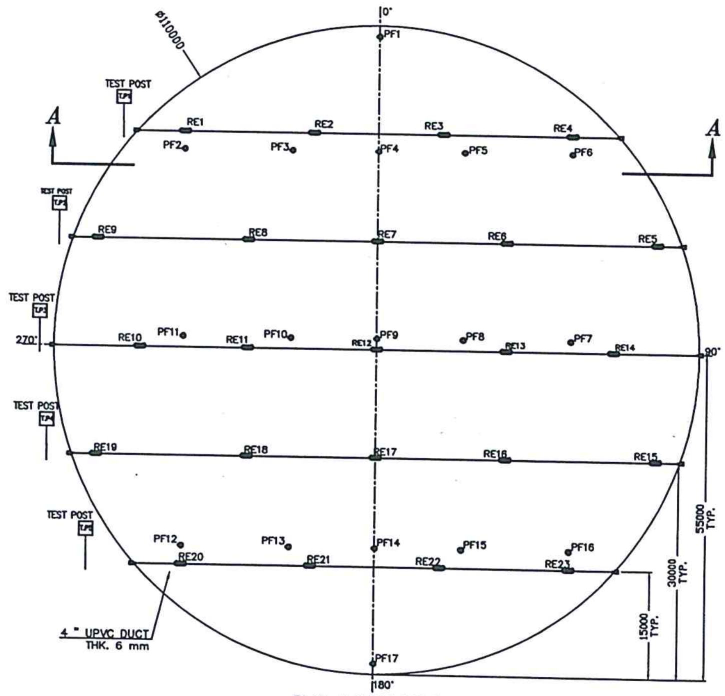
Code 1

10000-Z-000-PM1-FRM-0033 (11/14)


NOTES: -
To avoid clashes for the tank items below tank (including tank sump / piping) with anodes grid system, replica (model) for these items shall be installed prior to installation of the anode ribbons to ensure that the anodes system not clashing with any item.
0°
90°
180°
270°
18X3000=42000
18X3000=54000
ø110000
75mm UPVC MONITORING DUCT SOCK SURROUNDING AND PERFORATED
NEGATIVE DRAIN CONNECTING PAD
4"UPVC SLEEVE FOR MONITORING DUCT
MONITORING PIT 300x300x300mm
TI CONDUCTOR BAR
DETAIL-G
NEGATIVE DRAIN AND MONITORING CABLE CONNECTION DETAILS
TANK SHELL
ENCAPSULATION COMPOUND
1x50mm2 XLPE/PVC DRAIN CABLE OR 1X16mm2 XLPE/PVC MONITORING CABLE
8MM THICK PLATE WELDED TO TANK
M8 GI NUT & WASHER
SUITABLE THIN WALL PVC PIPE (75mm SIZE)
VIEW A-A
M8 S.S. HEX. HEAD BOLT
RADIUS OF CURVATURE = 10-20mm
CABLE LUG (TINNED COPPER)
TANK BOTTOM PLATE
to be 600 mail "*
DETAIL-C
MMO RIBBON ANODE & REFERENCE CELL INSTALLATION
75mm UPVC MONITORING DUCT SOCK SURROUNDING AND PERFORATED with10 mm. dia holes at 3,9,12 O'CLOCK
MONITORING DUCT
COMPACTED CLEAN SAND
MMO ANODE
REFERENCE CELL
SAND BACKFILL
CONDUCTOR BAR
100mm THK CLEAN SAND
DETAIL-B
MMO RIBBON ANODE & MONITORING DUCT (MD2) INSTALLATION DETAILS BELOW THE TANK BOTTOM
MMO ANODE RIBBON
PLAN
TANK BOTTOM
TI CONDUCTOR BAR
COMPACTED CLEAN SAND
SAND BACKFILL
CLEAN SAND
DIAMETER OF TANK=14.2 ms
SHELL OF TANK
NEGATIVE DRAIN/MONITORING CONNECTION PAD (SEE DETAIL-G)
MONITORING PIT (SEE DETAIL-F)
NATIVE SOIL
REFERENCE CELL CABLE ROUTING
3" UPVC SLEEVE FOR REFERENCE CELL CABLE EXIT
NEGATIVE DRAIN CABLE CONNECTION AND CABLE ROUTING
NEGATIVE DRAIN CABLE CONNECTION PAD AT 90°,270°
CLAMP
1x50mm2 XLPE/PVC CABLE FOR NEGATIVE DRAIN
DETAIL- D
ANODE RIBBON TO CONDUCTOR BAR CONNECTION
6.35x0.64mm ANODE RIBBON
12.7x0.9mm TITANIUM CONDUCTOR BAR
SPOT WELD
POWER FEED CABLE ROUTING
1x16mm2 XLPE/PVC POWER FEED CABLE
2X 4" UPVC SLEEVE FOR POWER FEED CABLE EXIT
DETAIL-A
POWER FEED TO CONDUCTOR BAR CONNECTION
POWER FEED CONNECTOR
HEAT SHRINK TUBE
POWER FEED CABLE 1x16 Sqmm XLPE/PVC, ROUTED TO TANK ANODE JUNCTION BOX VIA SHORTEST DISTANCE
FACTORY FABRICATED CONDUCTOR BAR SPOT WELDED TO MAIN BAR AT 5 LOCATIONS SPOT WELD (MIN. OF 5)
RUBBER TAPE
CRIMPED COPPER FERRULE
1/8"x4" LONG TITANIUM ROD WELDED TO POWER FEED CONDUCTOR BAR (FACTORY WELD)
DETAIL-E
MONITORING CONDUIT DETAILS
NYLON ROPE FROM ONE END OF DUCT TO OTHER END
3" MONITORING DUCT
4" UPVC SLEEVE FOR 3"PVC MONITORING DUCT EXIT AT 90°,270°
KNOT TO BE PROVIDED AT EITHER END OF THE ROPE
DETAIL-F
CONCRETE MONITORING PIT
CHEQUERED PLATE
HANDLE
CONCRETE PIT
REV.	DATE	DESCRIPTION	DRAWN	DESIGN	CHECK	APPR.
2	30-09-2019	ISSUED FOR CONSTRUCTION	Ramadan	A. SAAD	H. ALY	A. RAGAB
1	19-09-2019	ISSUED FOR CONSTRUCTION	Ramadan	A. SAAD	H. ALY	A. RAGAB
0	29-08-2019	ISSUED FOR APPROVAL	Ramadan	A. SAAD	H. ALY	A. RAGAB
PETROJET
THE PETROLEUM PROJECTS AND TECHNICAL CONSULTATIONS CO. CAIRO A.R.E
بتروجت
شركة المشروعات البترولية و الاستشارات الفنية
القاهرة - ج م ع
PROJECT : EGPC CRUDE OIL TANK FARM
CLIENT : ENPPI / EGPC
EXTERNAL CATHODIC PROTECTION SYSTEM DRAWING FOR CRUDE OIL STORAGE TANKS
DIMS. IN mm NOT TO SCALE
DWG. NO.: 1251-100-116-02-XX-D99-022
SHEET No. 1/1
REVISION 2



SECTION ELEVATION A–A.



PLAN OF RING BEAM

NOTES:–

1) THIS REFERENCE ELECTRODE IS USED ONLY DURING COMMISSIONING TO MEASURE THE POTENTIAL DROP AGAINST THE SECOND ELECTRODE.

2) TEST POST WILL BE INSTALLED AT ABOUT 5mt.

3) ANY CLASHES SHALL BE AVOIDED AT SITE DURING INSTALLATION.

REV.	DATE	DESCRIPTION	DRAWN	DESIGN	CHECK	APPR.
1	19-09-2019	ISSUED FOR CONSTRUCTION	Ramadan	A. SAAD	H. ALY	A. RAGAB
0	29-08-2019	ISSUED FOR APPROVAL	Ramadan	A. SAAD	H. ALY	A. RAGAB

PETROJET
THE PETROLEUM PROJECTS AND TECHNICAL CONSULTATIONS CO.
CAIRO A.R.E

بتروجت
شركة المشروعات البترولية و الاستشارات الفنية
القاهرة - ج.م.ع

PROJECT : EGPC CRUDE OIL TANK FARM

CLIENT : ENPPI / EGPC

EXTERNAL CATHODIC PROTECTION PERMANENT REFERENCE ELECTRODE INSTALLATION DRAWING FOR CRUDE OIL STORAGE TANKS

DIMS. IN mm / NOT TO SCALE	DWG. NO.: 1251-100-116-02-XX-D99-023	SHEET No. 1/1	REVISION 1

Enppi

SUPPLIER'S DOCUMENT COVER PAGE (FOR A4/A3 DOCUMENTS ONLY)

SUPPLIER'S NAME :	Petrojet
PURCHASE ORDER No :	01251-100-116-2-Q
DOCUMENT TITLE :	External Cathodic Protection Schematic Layout for Crude Oil Storage Tanks
TOTAL No OF PAGES :	Cover +1
SUPLLIER'S ORDER No :	

SUPPLIER'S OWN DOCUMENT No	SUPPLIER'S REVISION	DATE	SUPPLIER APPROVAL SIGNATURE
2019/CRUDE OIL-All Tank--30-D-3-CP-03	0	010., 9, 2019	Magdy
	1	18/9/2019	Magdy

SUPPLIER DOCUMENT REVIEW

PERMISSION TO PROCEED DOES NOT CONSTITUTE ACCEPTANCE OR APPROVAL OF DESIGN DETAILS, CALCULATIONS, ANALYSIS, TEST METHODS OR MATERIALS DEVELOPED OR SELECTED BY SUPPLIER FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.

Code 1

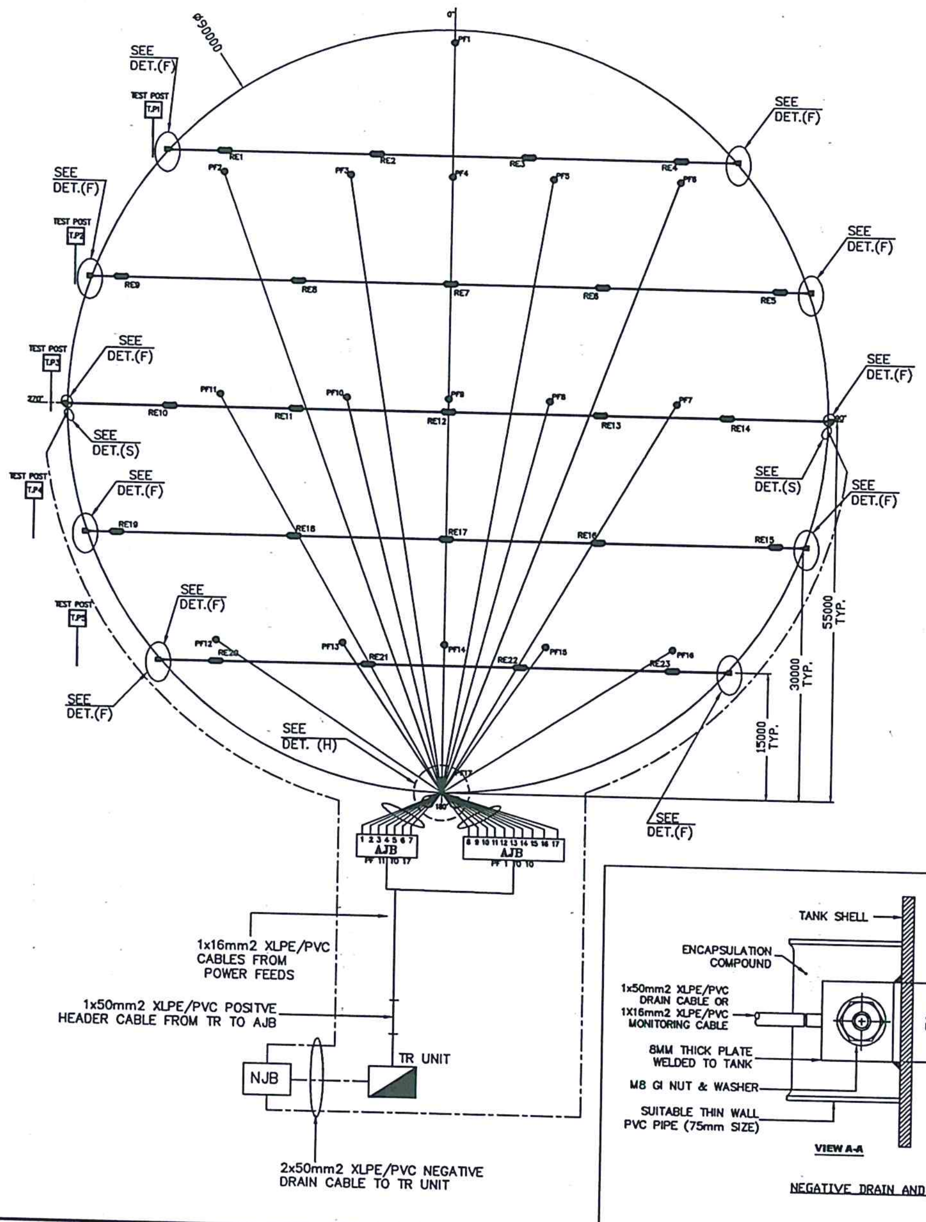
- ■ 1. WORK MAY PROCEED.
- ○ 2. REVISE AND RESUBMIT IN ACCORDANCE WITH COMMENTS, WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED.
- ○ 3. REVISE AND RESUBMIT, (MAJOR COMMENTS) WORK MAY NOT PROCEED.
- ○ 4. REJECTED, (REASON TO BE SPECIFIED ON THE DOCUMENT).
- ○ 5. HOLD FOR A SPECIFIC REASON (TO BE SPECIFIED ON THE DOCUMENT).

NAME: *Ahmed Kamal Abu ElMagd*

SIGNATURE: A. ElMagd DATE : *Sept. 26, 2019*

PROJECT TITLE	:	EGPC Crude Oil Tank Farm
ENPPI PROJECT NUMBER	:	01251-100
PACKAGE DESCRIPTION	:	Crude Oil Storage Tank
EQUIPMENT TAG	:	XX-T-01/2/3/4 -All Tank
CODE IDENTIFIER	:	C99

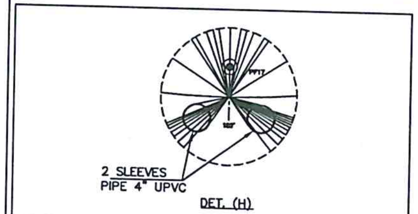
DOCUMENT NUMBER	REV
1251-100-116-02-XX-D99-024	0



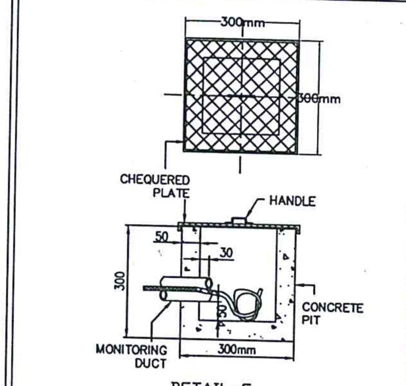
NOTE:

- TR UNIT – TRANSFORMER RECTIFIER UNIT
- AJB – ANODE JUNCTION BOX
- TP(1 TO 5)– TEST POST
- PF(1 TO 17)– POWER FEEDS
- RE(1 TO 23)– REFERENCE ELECTRODE
- ———— POSITIVE HEADER CABLE.
- —·—·— NEGATIVE HEADER CABLE.
- TR UNIT – TRANSFORMER RECTIFIER UNIT

– ANY CLASHES SHALL BE AVOIDED AT SITE DURING INSTALLATION.

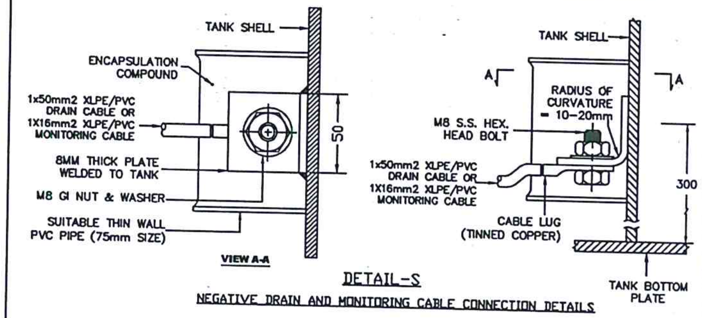


DET. (H)



DETAIL–F

CONCRETE MONITORING PIT



DETAIL–S

NEGATIVE DRAIN AND MONITORING CABLE CONNECTION DETAILS

REV.	DATE	DESCRIPTION	DRAWN	DESIGN	CHECK	APPR.
1	19-09-2019	ISSUED FOR CONSTRUCTION	Ramadan	A. SAAD	H. ALY	A. RAGAB
0	29-09-2019	ISSUED FOR APPROVAL	Ramadan	A. SAAD	H. ALY	A. RAGAB

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THE PETROLEUM PROJECTS AND TECHNICAL CONSULTATIONS CO.
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بتروجت
شركة المشروعات البترولية و الاستشارات الفنية
القاهرة - ج.م.ع

PROJECT : EGPC CRUDE OIL TANK FARM

CLIENT : ENPPI / EGPC

EXTERNAL CATHODIC PROTECTION SCHEMATIC LAYOUT FOR CRUDE OIL STORAGE TANKS

DIMS. IN mm NOT TO SCALE	DWG. NO.: 1251-100-116-02-XX-D99-024	SHEET No. 1/1	REVISION 1

Please refer to the project drawing "Doc number 1251-100-116-002-D99-005 External Cathodic Protection Permanent Reference Electrode Installation drawing for Fire Water Storage Tanks" for precise location / orientation of these pipes.

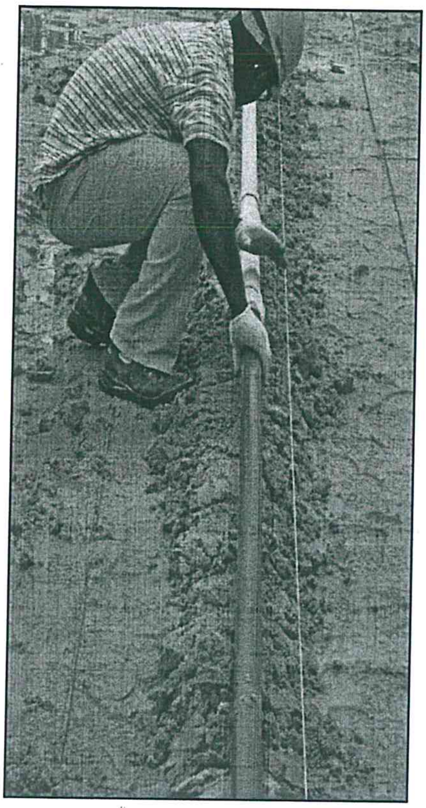
The slotted pipe will have a galvanized steel rope passed through entire length of the pipe as it is being assembled and terminated at each end to be used a draw cord The rope is tied wrapped to the Portable Cu/CuSO4 reference electrode which in turn has a 120m cable tail to allow passage under the entire tank base. When not in use the cable tail / Galvanised steel wire should be safely coiled and stored in the monitoring pits provided.

The PVC is pipe is supplied in 3 to 5.8m lengths and is joined by M/F threaded connection.

The geotextile sleeve is provided loose to be fitted during construction to prevent the backfill media from entering the slotted tube.

For the portable cell to operate successfully it is suggested to wrap in a wet sponge material creating an interference fit within the PVC tube.

Ensure the insulation of the cables is not damaged during the pulling of the cables.



The slotted monitoring pipe should be laid on a sand bank running across the tank base 150mm above the MMO Grid and then routed through the 4" conduit at plant east and west side of the ring beam.

5.2 MMO RIBBON & CONDUCTOR BAR

Please refer to:

Document Number 1251-100-116-02-XX-D99-022 External Cathodic Protection System Drawing For Crude Oil Storage Tank

Document Number 1251-100-116-002-D99-004 External Cathodic Protection System Drawing For Fire Water Storage Tank

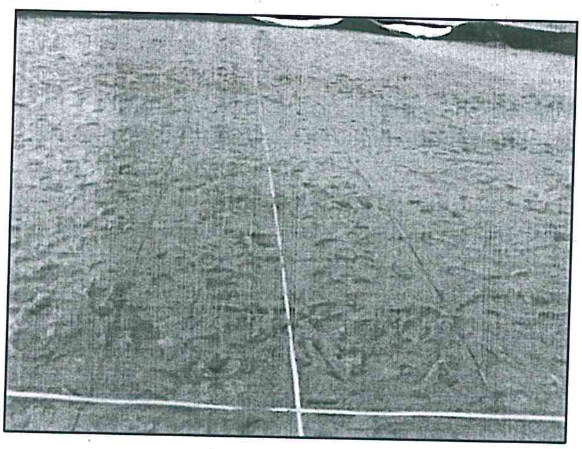
For the successful operation of the Cathodic Protection system, it is imperative that the MMO Ribbon is installed at a uniform minimum depth of 600mm below the tank bottom.

The foundations of the tanks shall be constructed to the point where they would be at least 350 to 400mm (layer of soft sand) below the bottom of the tank. It must be noted that the MMO Ribbon anodes and conductor bar assembly MUST be placed above the membrane.

The membrane should be at 100mm below the proposed location of MMO ribbon grid. In addition, it is essential that the membrane shall cover the entire inner face of the concrete ring beam foundations to isolate the reinforcing rebar from the anode network. The Civil Contractor shall confirm the membrane is a uniform 700 mm depth below the proposed bottom of the tank, before proceeding further.

A 100mm layer of chloride free, clean washed sand shall be installed directly above the membrane, which shall be compacted according to the project standard and the anode shall be installed on this layer. The pattern of the anodes and conductor bar shall be as shown in the referenced drawings.

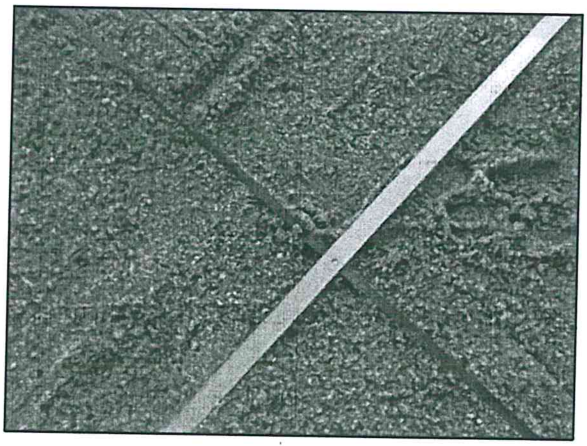
The anode ribbon shall be placed onto the sand layer in the pattern shown in the relevant design drawing, and then the Titanium conductor bars laid out. Where appropriate, the anodes shall be weighted down to avoid movement however, great care shall be taken to ensure that the coating of the anodes is not scratched or damaged in any way.



Grid style layout of anode ribbon and conductor bars

The spot welder, provided shall be used for all welds and shall be operated in accordance with the manufacturer's Operation Manual by an experienced operative – see appendix 2 for operation instructions.

A sample test weld between the anode ribbon and conductor bar should first be carried out in order to ensure good quality welds. A pull test (by hand) to ensure the weld cannot be pulled apart. A resistance test between the welded element shall be carried to ensure the weld integrity. The acceptance criteria for the resistance between the welded elements shall be 0.1ohm using a calibrated multimeter.



MMO Ribbon anode spot welded to titanium conductor

The sample spot weld shall be inspected by a Cathodic Protection Engineer or other responsible authorised person.

Each weld carried shall be tested with a pull test (by hand) and have a resistance test carried out. The results shall be recorded. The settings on the spot welder unit should be also recorded.

The recommended setting is as follows:

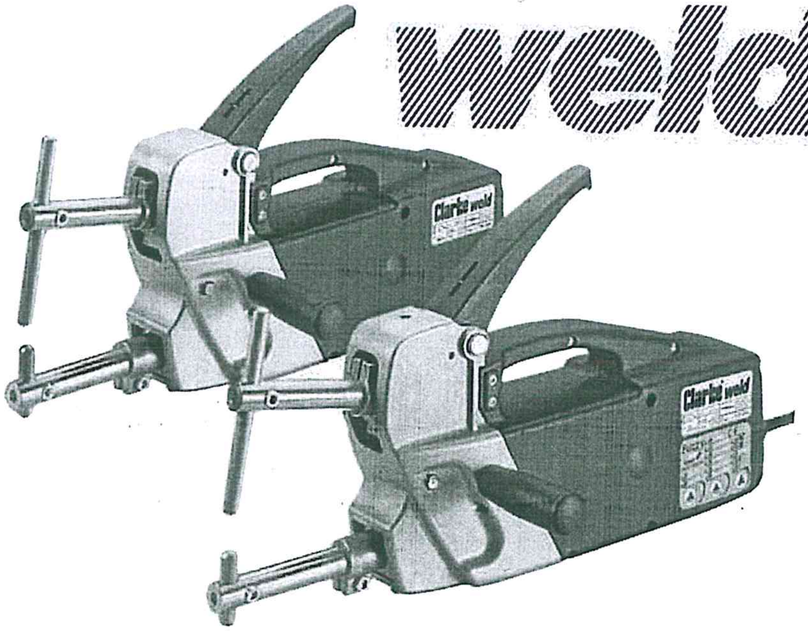
- MMO ribbon anode to MMO ribbon anode: 2 seconds.
- MMO ribbon anode to Titanium conductor bar: 3 seconds
- Titanium conductor bar to Titanium conductor bar: 5 seconds

At each and every crossover of the anode ribbon with the conductor bar, the anode shall be resistance welded, (spot welded) to the conductor bar a minimum of twice. Where necessary, anodes and conductor bars shall be extended using the same procedure.

5.3 POWERFEED CONNECTORS

The power feed connection locations shall be identified as per the reference drawings.

Power feed connectors are factory connected to the $16mm^2$ cable using a splice kit. The Conductor bar tail from the power feed cable encapsulation shall be connected to the conductor



SPOT WELDER

Models CSW6T & CSW13T

Part Nos. 6030005 & 60300010

0204

OPERATING & MAINTENANCE INSTRUCTIONS

CE

FEATURES

Model CSW6T

This 230V 50Hz, portable Spot Welder is provided with an electronic timer which allows precise control of welding time. The control knob is arrowed in Fig. 1.

Electrode pressure may be mechanically adjusted from 40 to 120kg, to spot weld low carbon sheet steel up to 1 + 1 mm in thickness.

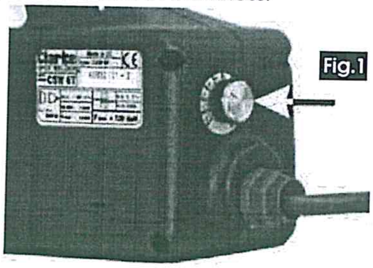


Fig.1

Model CSW13T

The most important features of this 230V 50Hz Portable Spot Welder are controlled by a microprocessor, managed from the control panel, shown in Fig. 2. These features are:

1. Welding time, set according to the thickness of metal to be welded.
2. Changing selection for Welding thickness
3. Changing resistance welding machine operating mode... normal or pulse.

   Selecting 'PULSE' mode improves welding capacity on material with high yield points or materials with protective coatings. The pulsation period is preset and does nor require adjustment.

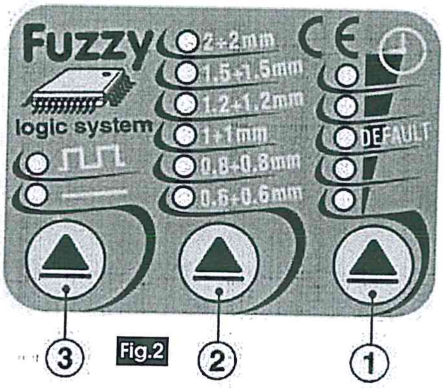


Fig.2

4. Electrode pressure may be mechanically adjusted from 40 to 120kg, to spot weld low carbon sheet steel up to 2 + 2 mm in thickness.

Both Models

- 120mm Electrode Arms and standard electrodes are provided.
- An eye bolt may be fitted to the machine (see your Clarke dealer), for use in supporting the machines weight when repetitive welds are required (see your Clarke dealer). **IMPORTANT! When using the Eye Bolt, Take care NOT to screw it more than 8mm into the screw hole.**

UNPACKING & PARTS IDENTIFICATION

Unpack and lay out the components, checking against the following list. Please report any damage which may have occurred during transit, to your CLARKE dealer immediately.

1. Welder complete.
2. 1 x Handle - **A**
3. 2 x Electrode Holders - **B**
4. 2 x Electrodes (straight) - **C**
5. 2 x Hex. Wrenches - **D**
6. 1 x M6 Screw - **F**

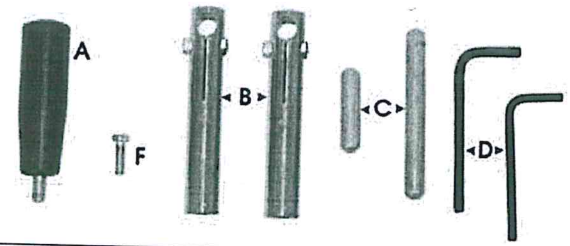


Fig.3

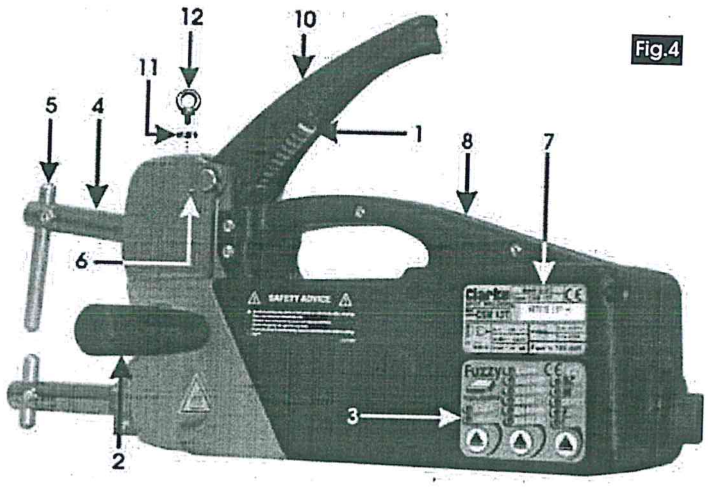
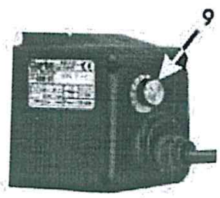


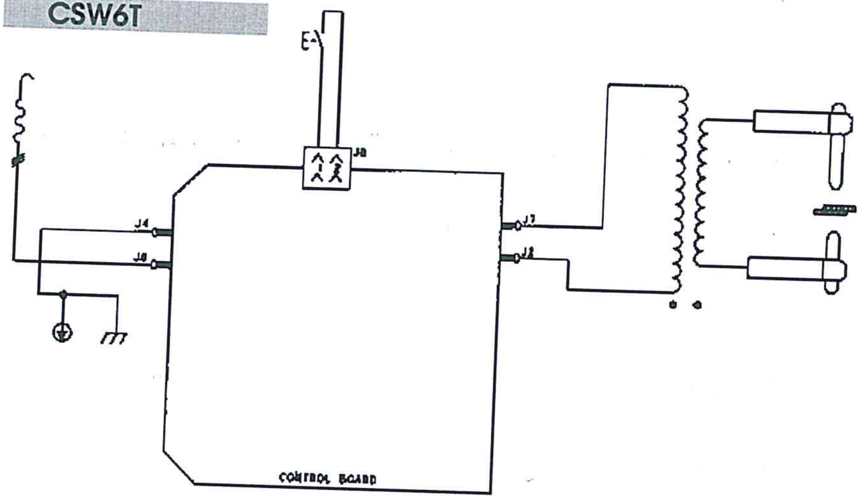
Fig.4

1.	Pressure Adjuster screw	7.	Data Label
2.	Handle	8.	Microswitch
3.	Control panel (13T)	9.	Weld Time Adjuster (6T)
4.	Electrode Arm	10.	Operating Lever
5.	Electrode (Long)	11.	Spacer (Optional)
6.	Screw Locating Hole	12.	Lifting Eye (optional)

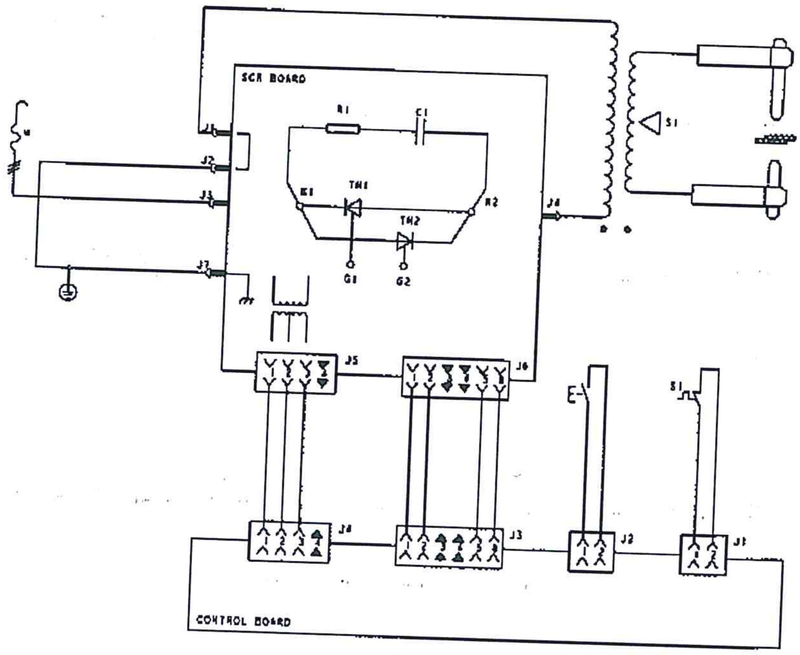


SCHEMATIC WIRING DIAGRAMS

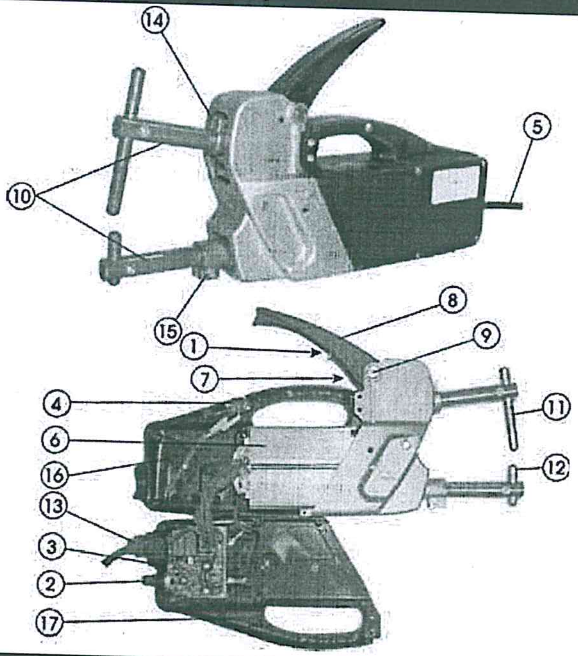
CSW6T



CSW13T

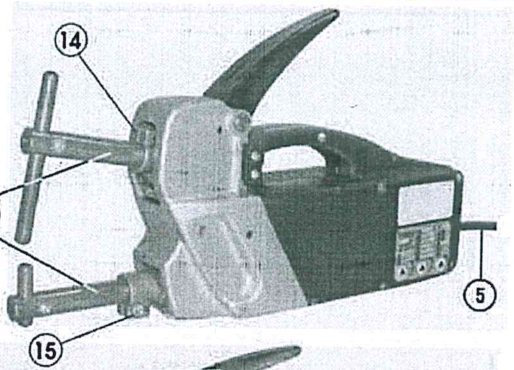


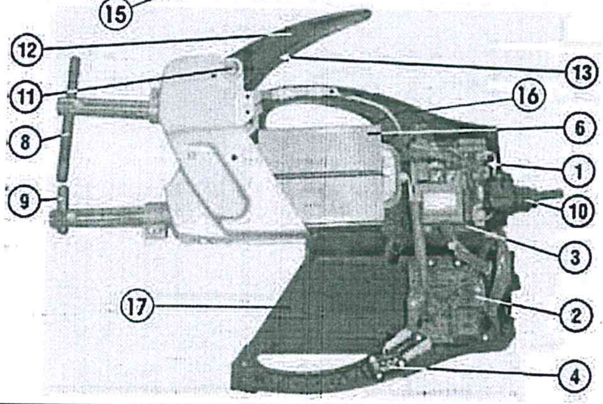
SPARE PARTS - CSW6T



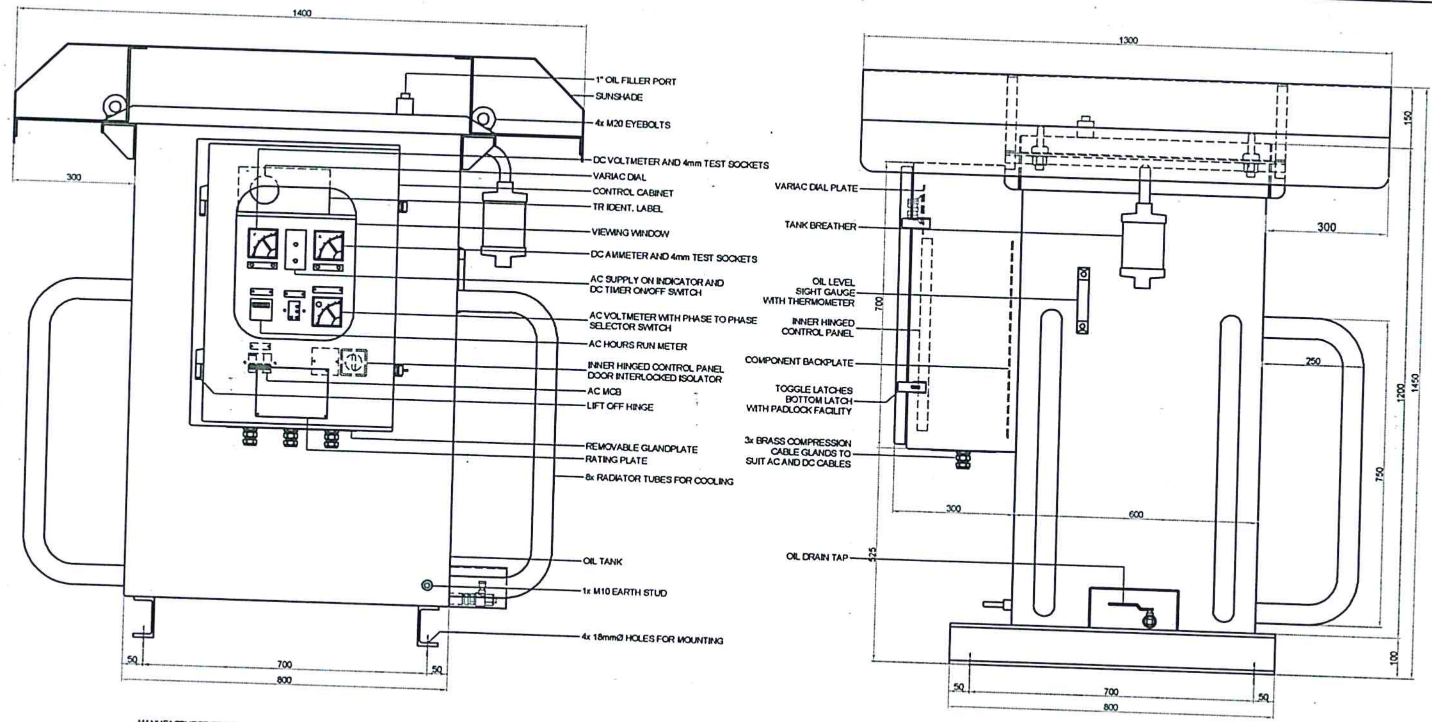
No.	Description	No.	Part Number
1	Bush	1	TT322518
2	Potentiometer (Adjuster) Knob	1	TT112299
3	Timer PCB	1	TT114236
4	Microswitch	1	TT122393
5	Mains Cable	1	TT132104
6	Transformer	1	TT169152
7	Adjuster Screw	1	TT121263
8	Operating Lever	1	TT322512
9	Pivot Pin	1	TT482887
10	See Page 13 for full range of Arms		
11	See Page 13 for full range of Electrodes		
12	See Page 13 for full range of Electrodes		
13	Cable Kit - Bushing, Ring Nut	1	TT990046
14	Upper Arm Clamp	1	TT522020
15	Lower Arm Clamp	1	TT522023
16	Left Shell	1	TT322509
17	Right Shell	1	TT322526

SPARE PARTS - CSW13T





No.	Description	No.	Part Number
1	Screw	1	TT113908
2	Control PCB	1	TT114070
3	Power PCB	1	TT114085
4	Microswitch	1	TT122393
5	Mains Cable	1	TT132104
6	Transformer	1	TT169034
10	Cable Kit - Bushing, Ring Nut	1	TT990046
11	Pivot Pin	1	TT482887
12	Operating Lever	1	TT322512
13	Adjuster Screw	1	TT212163
14	Upper Arm Clamp	1	TT522020
15	Lower Arm Clamp	1	TT522023
16	Right Shell	1	TT322510
17	Left Shell	1	TT322511



MANUFACTURED FROM
TANK 3mm MILD STEEL SHEET
CABINETS AND SUNSHADE 2.0mm MILD STEEL SHEET
INGRESS PROTECTION IP65

FINISH: (SUITABLE FOR HARSH MARINE ENVIRONMENT C5-M)
EXTERNAL SURFACES INCLUDING
SHOTBLAST SA2.5
HOT ZINC SPRAY 100 MICRONS
INTERPON BPP600 EPOXY PRIMER 60 MICRONS
POLYESTER POWDER 70 MICRONS

INTERNAL SURFACES
SHOTBLAST SA2.5
INTERPON BPP600 EPOXY PRIMER 60 MICRONS
POLYESTER POWDER 70 MICRONS

COLOUR ALL SURFACES: DARK GREY

REV.	DESCRIPTION	DATE	APPROVED
0	FOR APPROVAL	11.10.19	AA

REVISIONS

PROJECTION

FOR APPROVAL

FOR CUSTOMER USE ONLY

APPROVED: ☐ (TICK) DATE:__________

NAME: __________

SIGNED: __________

BAC®
CORROSION CONTROL
www.bacgroup.com

PROJECT: CR35913

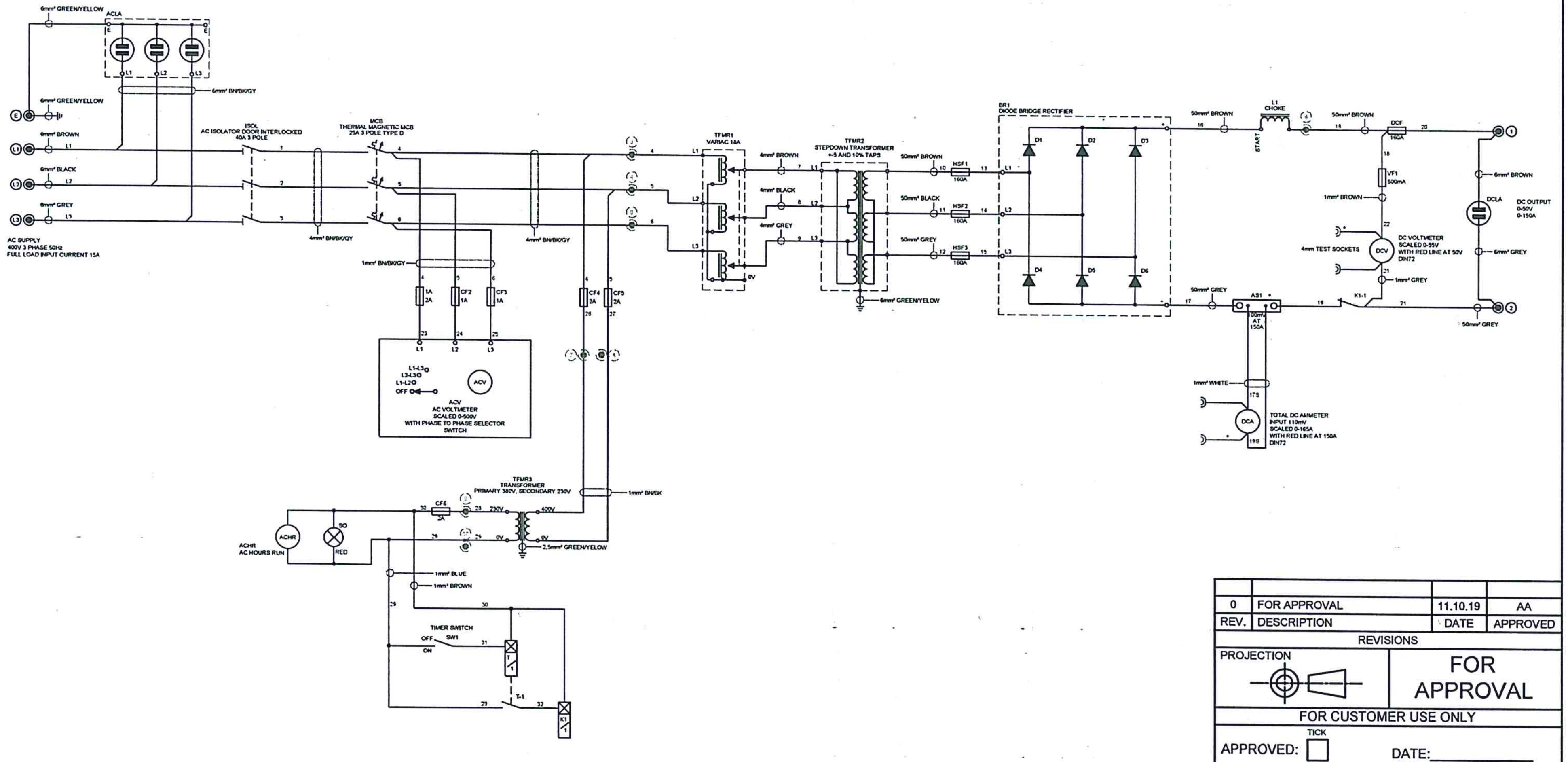
TITLE: GENERAL ARRANGEMENT DRAWING
VARIAC CONTROL TRANSFORMER RECTIFIER
AC SUPPLY 400V 3PH 50Hz
DC OUTPUT 50V 150A
PN

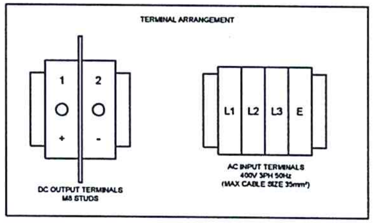
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MATERIAL: -

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DWG NO. CR35913-001 REVISION: -R0





BUILT TO BS 7671:2008+A3:2015 REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, IET WIRING REGULATIONS. DEVIATION AGAINST DC VOLTAGE IN CONTROL CIRCUITS LESS THAN 5V WERE WE USE WHITE CABLES.
LAST WIRE NUMBER: 32

REV.	DESCRIPTION	DATE	APPROVED
0	FOR APPROVAL	11.10.19	AA

REVISIONS

PROJECTION

FOR APPROVAL

FOR CUSTOMER USE ONLY

APPROVED: ☐ (TICK) DATE:________

NAME:________

SIGNED:________

BAC CORROSION CONTROL
www.bacgroup.com

PROJECT: CR35913

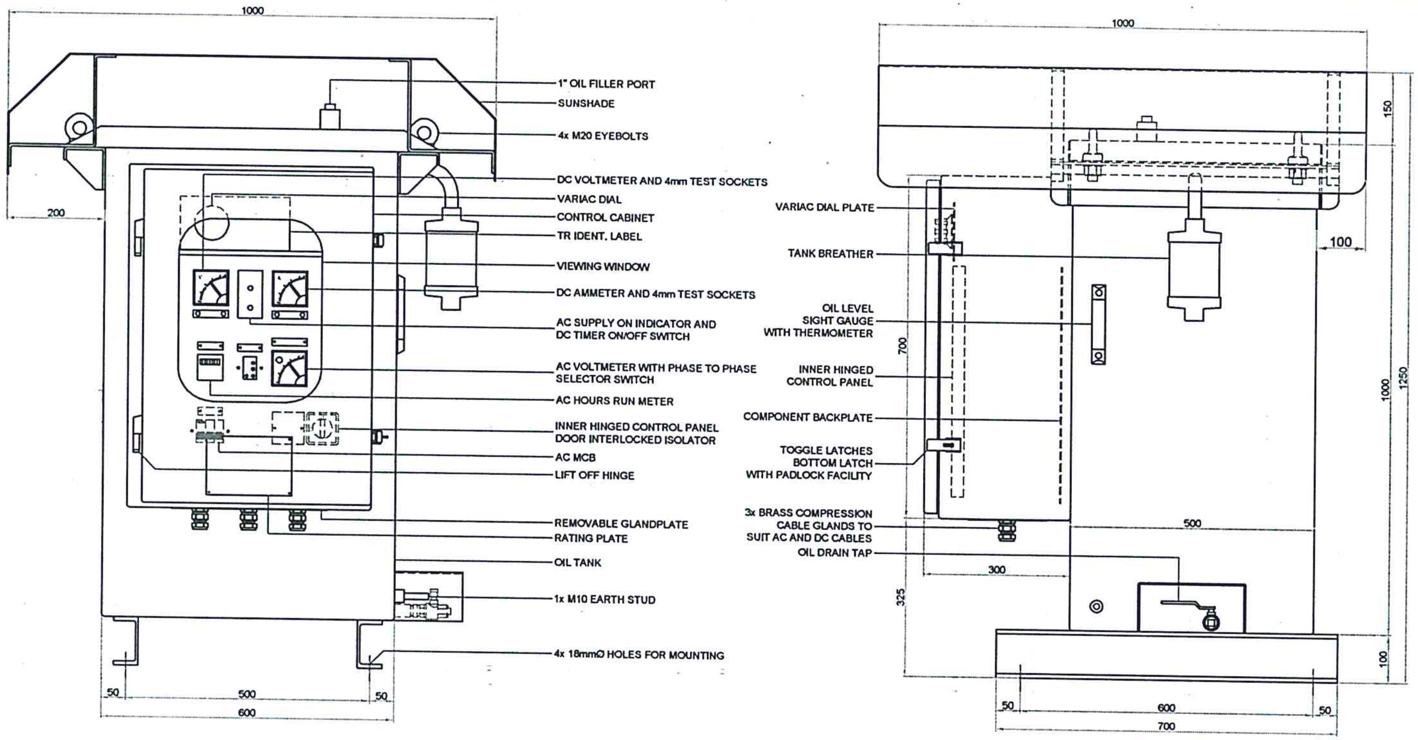
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VARIAC TRANSFORMER RECTIFIER
AC SUPPLY 400V 3PH 50Hz
DC OUTPUT 50V 150A
PN

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	NAME	DATE	FINISH: -		
DRAWN	JAC	11.10.19	SHEET 1 OF 1	SCALE:NTS	A3

DWG NO. CR35913-002 REVISION: -R0



MANUFACTURED FROM
TANK 3mm MILD STEEL SHEET
CABINETS AND SUNSHADE 2.0mm MILD STEEL SHEET
INGRESS PROTECTION IP65

FINISH: (SUITABLE FOR HARSH MARINE ENVIRONMENT C5-M)
EXTERNAL SURFACES INCLUDING
SHOTBLAST SA2.5
HOT ZINC SPRAY 100 MICRONS
INTERPON BPP600 EPOXY PRIMER 60 MICRONS
POLYESTER POWDER 70 MICRONS

INTERNAL SURFACES
SHOTBLAST SA2.5
INTERPON BPP600 EPOXY PRIMER 60 MICRONS
POLYESTER POWDER 70 MICRONS

COLOUR ALL SURFACES: DARK GREY

REV.	DESCRIPTION	DATE	APPROVED
0	FOR APPROVAL	11.10.19	AA

REVISIONS

PROJECTION

FOR APPROVAL

FOR CUSTOMER USE ONLY

APPROVED: ☐ (TICK) DATE:________

NAME: ________

SIGNED: ________

BAC® CORROSION CONTROL www.bacgroup.com

PROJECT: CR35913

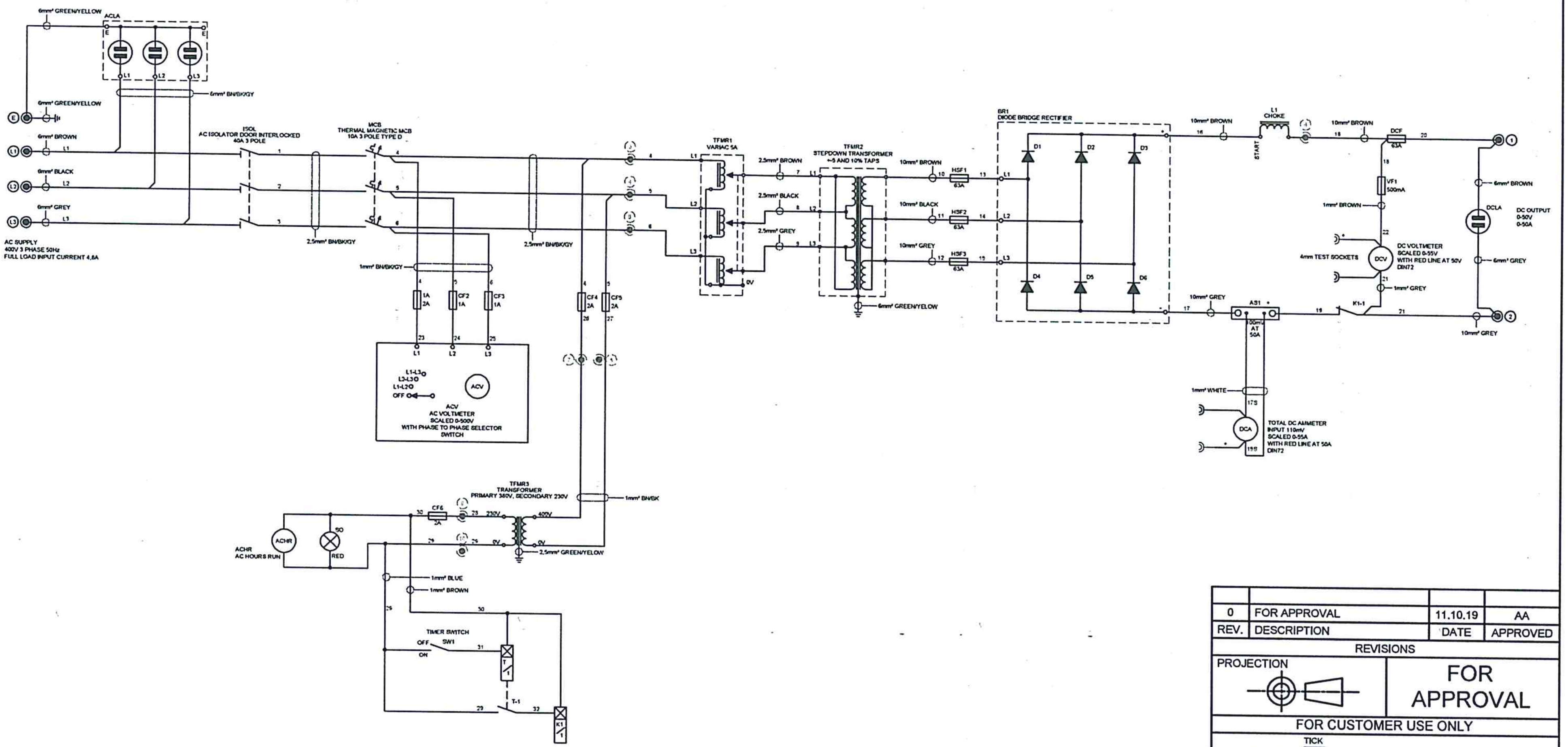
TITLE: GENERAL ARRANGEMENT DRAWING
VARIAC CONTROL TRANSFORMER RECTIFIER
AC SUPPLY 400V 3PH 50Hz
DC OUTPUT 50V 50A
PN

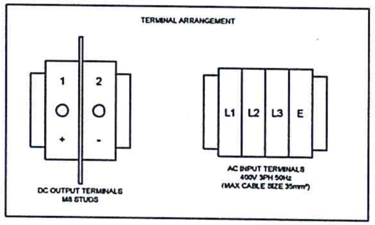
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MATERIAL: -

	NAME	DATE	FINISH: -		
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DWG NO. CR35913-003 REVISION: -R0





BUILT TO BS 7671:2008+A3:2015 REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
IET WIRING REGULATIONS. DEVIATION AGAINST DC VOLTAGE IN CONTROL CIRCUITS
LESS THAN 5V WERE WE USE WHITE CABLES.
LAST WIRE NUMBER: 32

REV.	DESCRIPTION	DATE	APPROVED
0	FOR APPROVAL	11.10.19	AA

REVISIONS

PROJECTION

FOR APPROVAL

FOR CUSTOMER USE ONLY

APPROVED: ☐ (TICK) DATE: ______

NAME: ______

SIGNED: ______

BAC® CORROSION CONTROL
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PROJECT: CR35913

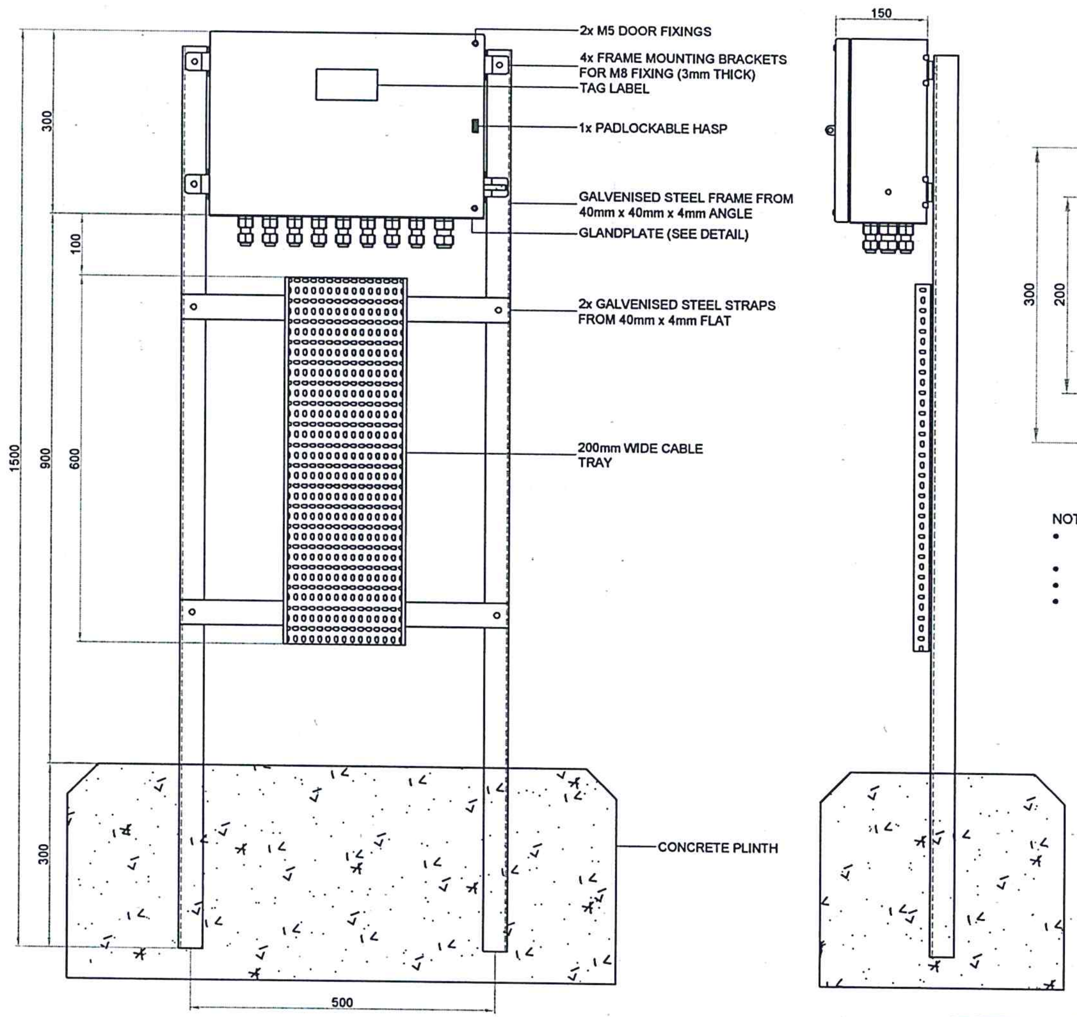
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VARIAC TRANSFORMER RECTIFIER
AC SUPPLY 400V 3PH 50Hz
DC OUTPUT 50V 50A
PN

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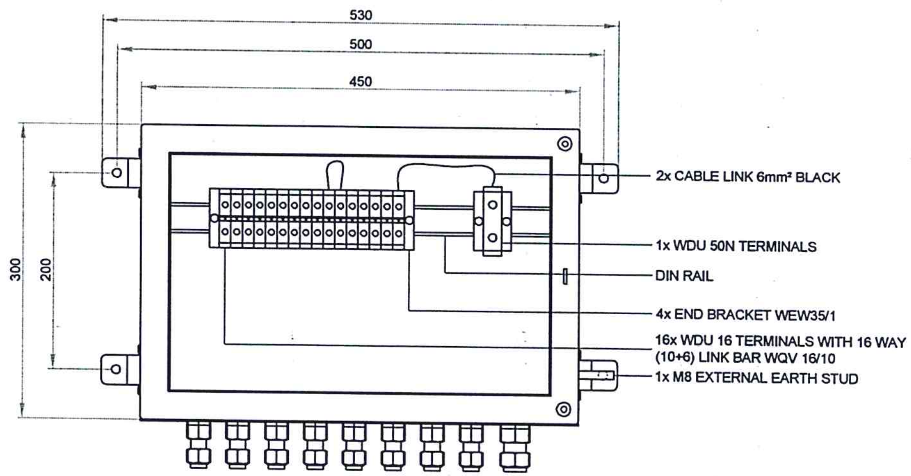
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	NAME	DATE	FINISH: -		
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DWG NO. CR35913-004 REVISION: -R0



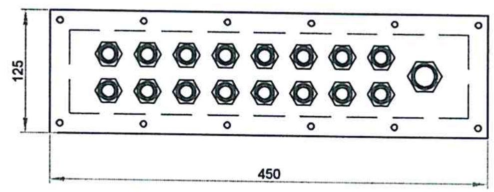
VIEW OF FRONT DOOR OFF
SCALE 1:5



NOTES:

- CABINET MANUFACTURED FROM 1.5mm 316L STAINLESS STEEL
- CABINET IP65
- CABINET DOOR WITH HINGE ON LEFT HAND SIDE
- CABINET FINISH NATURAL BRUSHED

GLANDPLATE DETAIL
SCALE 1:5



NICKEL PLATED BRASS CABLE GLANDS TO SUIT:
1x M20 50mm^2 UNARMORED CABLE
16x M20S16 16mm^2 UNARMORED CABLE

REV.	DESCRIPTION	DATE	APPROVED
D	ISSUED FOR PRODUCTION	20/01/20	AA

REVISIONS

FOR CUSTOMER USE ONLY
APPROVED : ☐ TICK DATE : ______
NAME : ______
SIGNED : ______

THIRD ANGLE PROJECTION

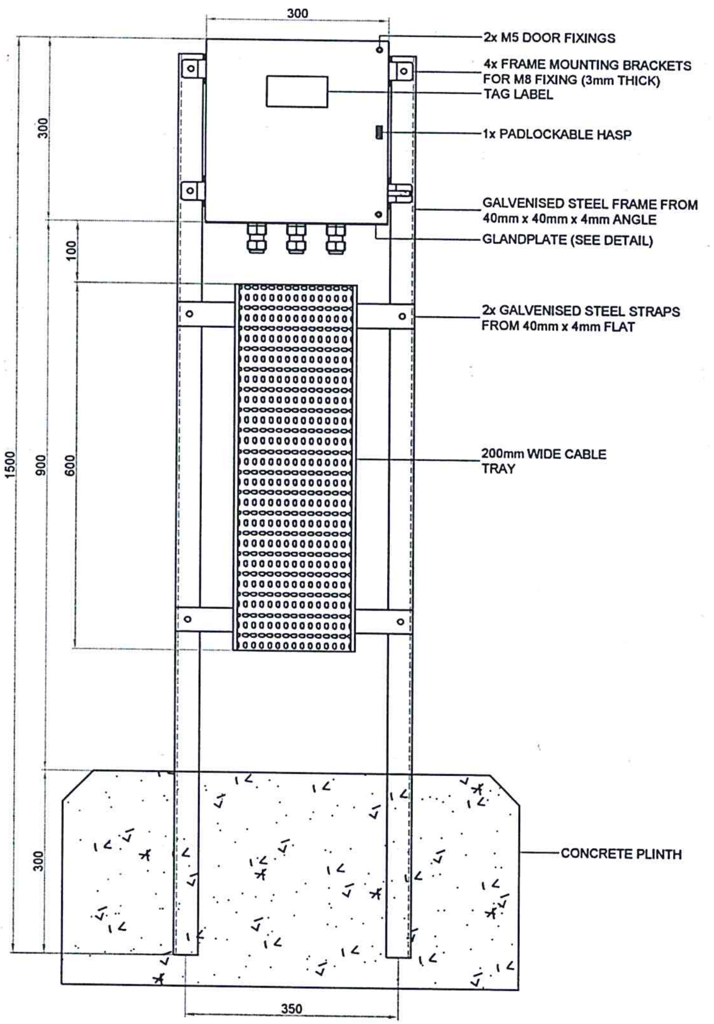
BAC
CORROSION CONTROL

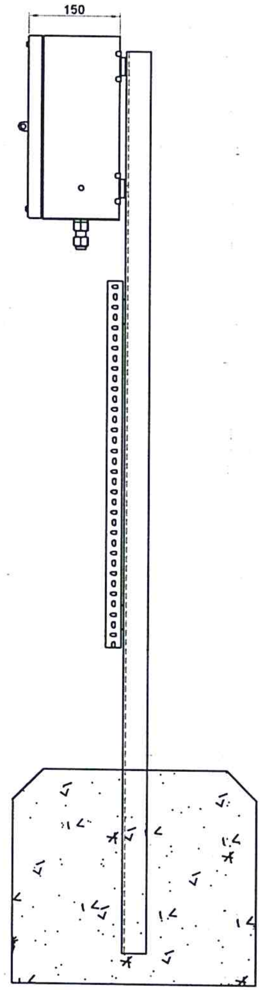
www.bacgroup.com

ALL DIMENSION IN mm UNLESS OTHERWISE STATED

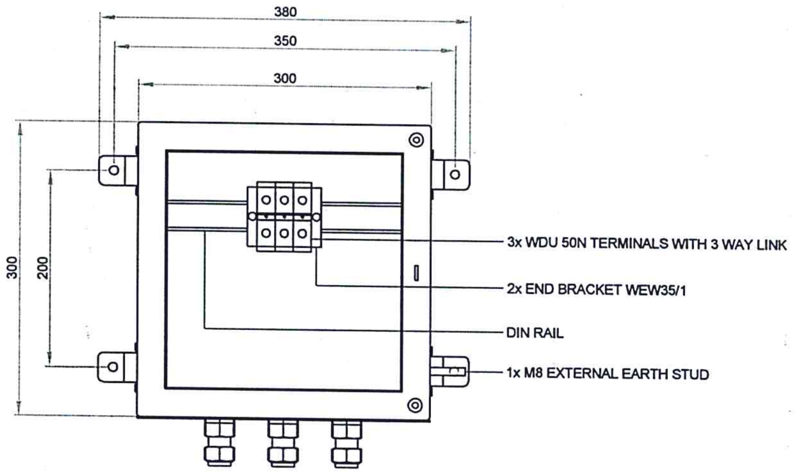
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GENERAL ARRANGEMENT DRAWING
POSITIVE JUNCTION BOX 16 WAY

PROJECT No. CR35913			PART No. 0140010123	
	NAME	DATE	DWG SCALE: 1:6	DWG SIZE: A3
DRAWN	JAC	20/01/20	SHEET: 1 of 1	
DWG No. CR35913-005				REVISION: R0





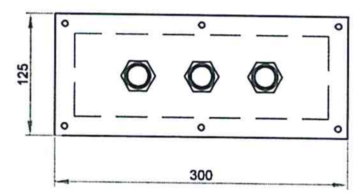
VIEW OF FRONT DOOR OFF
SCALE 1:5



NOTES:

- CABINET MANUFACTURED FROM 1.5mm 316L STAINLESS STEEL
- CABINET IP65
- CABINET DOOR WITH HINGE ON LEFT HAND SIDE
- CABINET FINISH NATURAL BRUSHED

GLANDPLATE DETAIL
SCALE 1:5



NICKEL PLATED BRASS CABLE GLANDS TO SUIT:
3x M20 50mm² UNARMORED CABLE

REV.	DESCRIPTION	DATE	APPROVED
D	ISSUED FOR PRODUCTION	20/01/20	AA

REVISIONS

FOR CUSTOMER USE ONLY
APPROVED : ☐ TICK DATE : ____
NAME : ____
SIGNED : ____

THIRD ANGLE PROJECTION

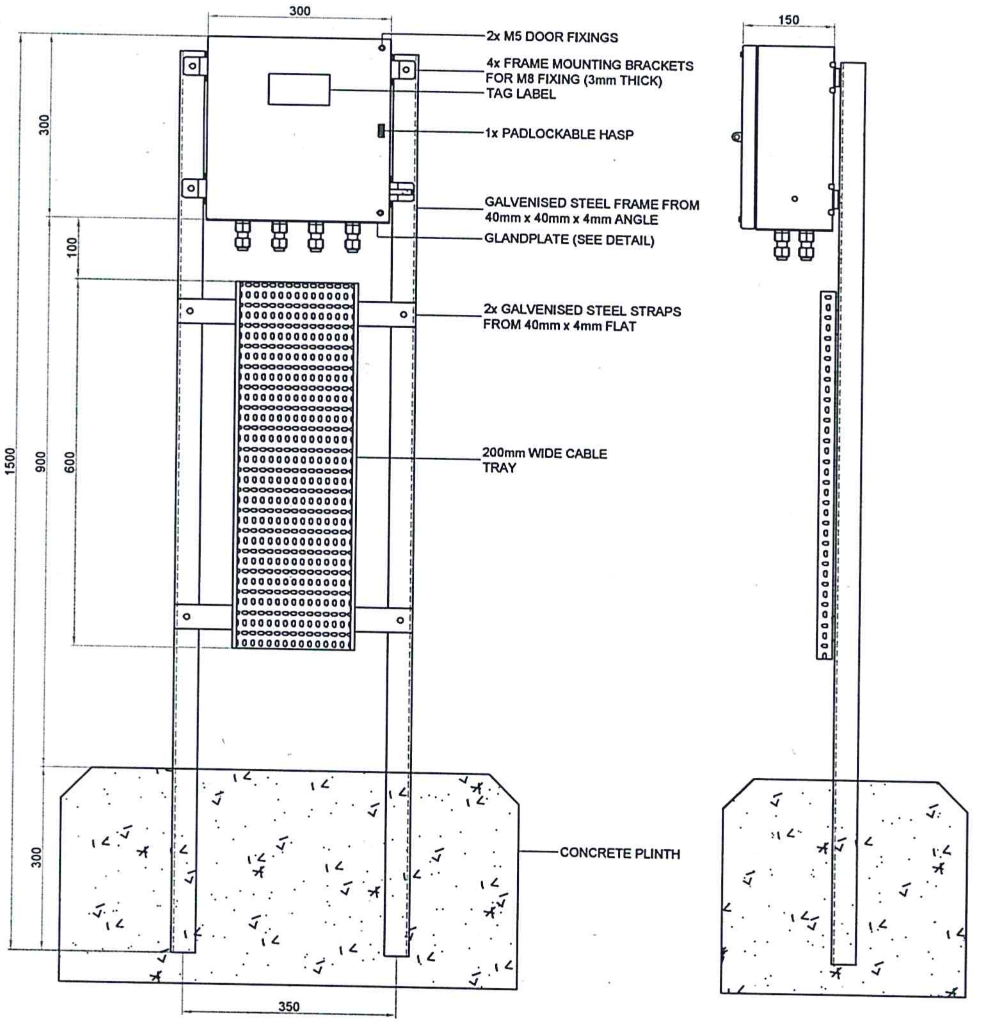
BAC CORROSION CONTROL

www.bacgroup.com

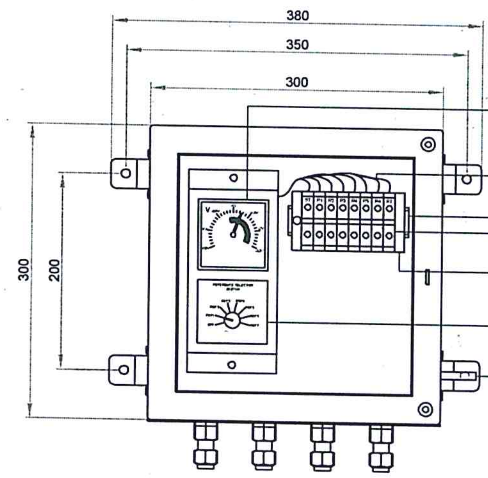
ALL DIMENSION IN mm UNLESS OTHERWISE STATED

TITLE:
GENERAL ARRANGEMENT DRAWING
NEGATIVE JUNCTION BOX 3 WAY

PROJECT No. CR35913			PART No. 0140010125	
	NAME	DATE	DWG SCALE: 1:6	DWG SIZE: A3
DRAWN	JAC	20/01/20	SHEET: 1 of 1	
DWG No. CR35913-007				REVISION: R0

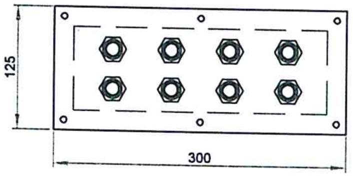


VIEW OF FRONT DOOR OFF
SCALE 1:5



NOTES:
- CABINET MANUFACTURED FROM 1.5mm 316L STAINLESS STEEL
- CABINET IP65
- CABINET DOOR WITH HINGE ON LEFT HAND SIDE
- CABINET FINISH NATURAL BRUSHED

GLANDPLATE DETAIL
SCALE 1:5



NICKEL PLATED BRASS CABLE GLANDS TO SUIT:
8x M20S16 10mm^2 UNARMORED CABLE

REV.	DESCRIPTION	DATE	APPROVED
D	ISSUED FOR PRODUCTION	20/01/20	AA

REVISIONS

FOR CUSTOMER USE ONLY
APPROVED: ☐ TICK DATE: ______
NAME: ______
SIGNED: ______

THIRD ANGLE PROJECTION

BAC CORROSION CONTROL

ALL DIMENSION IN mm UNLESS OTHERWISE STATED

TITLE:
GENERAL ARRANGEMENT DRAWING
TEST POST 7 WAY

PROJECT No. CR35913			PART No. 0140010126	
	NAME	DATE	DWG SCALE: 1:6	DWG SIZE: A3
DRAWN	JAC	20/01/20	SHEET: 1 of 1	
DWG No. CR35913-008				REVISION: R0

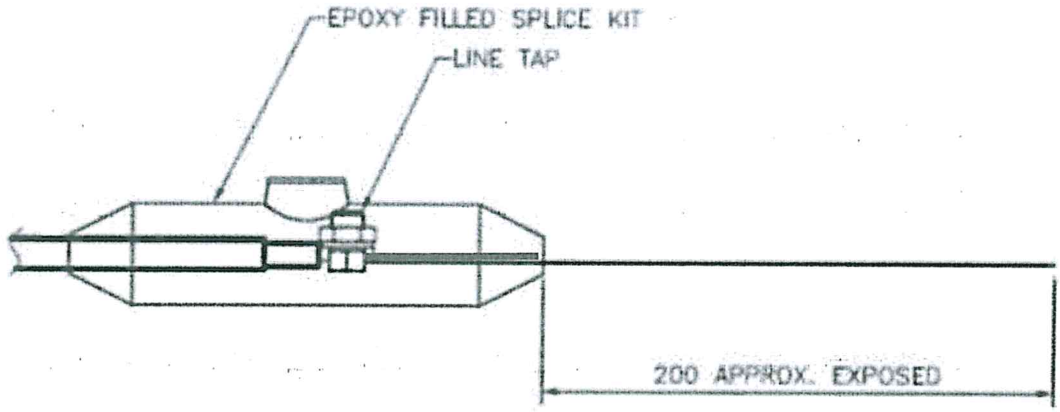
MIXED METAL OXIDE ANODES RIBBON TYPE POWER FEED CONNECTION KIT

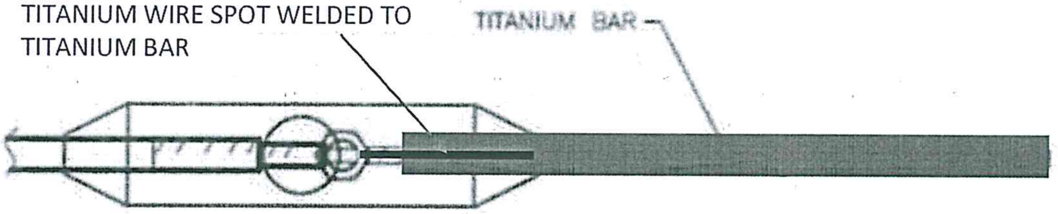
DATASHEET 1.11

POWER FEED CONNECTOR

APPLICATION : For power feed connections on under tank grid anode system. The power feed connector connects the DC current feeder cable to the Titanium Conductor Bar.

Anode Power Feed Connector comprises 12.7mm width x 0.9mm Thickness x 200mm length Titanium Conductor Bar spot welded to a 100mm length of 3mm dia Titanium Wire. Encapsulation to the DC feeder cable is made by an epoxy splice kit and line tap connector generally as detailed below





Quantity : 551 No (for Crude Oil Tanks)
Powerfeed Connectors supplied with 500m of 16mm2 XLPE/PVC Cable Tail , Colour Red

Quantity : 77 No (for Fire Water Tanks)
Powerfeed Connectors supplied with 160m of 16mm2 XLPE/PVC Cable Tail , Colour Red

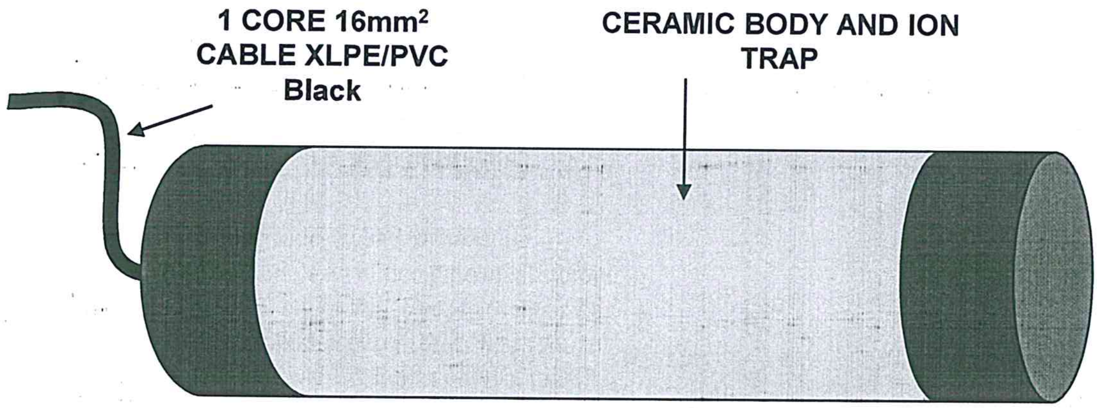
BAC® CORROSION CONTROL
MEMBER OF MIDROC EUROPE

PERMANENT COPPER / COPPER SULPHATE REFERENCE ELECTRODE

DATASHEET

CU/CUSO4 REFERENCE ELECTRODE

This permanent reference electrode is used to measure Cathodic Protection (CP) potentials on buried pipelines, storage tanks and other buried metallic structures to which CP has been applied. Can be used with a pipeline coupon that allows you to take an IR free potential reading without interruption of the CP system.



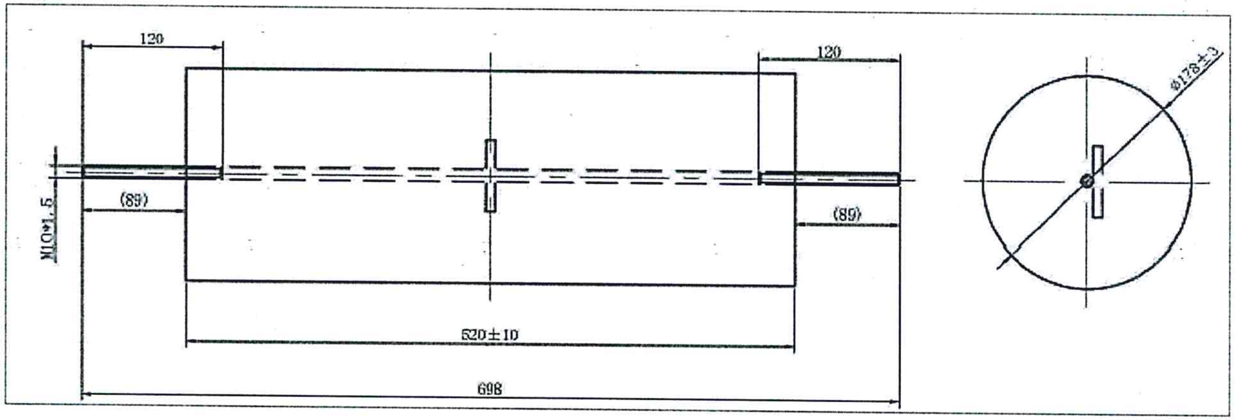
STANDARD SPECIFICATION	
Electrolyte	Saturated Copper Sulphate Gel (98.4% Min Purity Cu/SO_4 crystals)
Electrode Body Materials	High Temperature Fired Ceramic and Ion Trap.
Weight (Gross)	Approx 1Kg net weight
Dimensions	Approx 36mm Dia x 200mm (Bare Dimensions)
Cable	1c x 16mm² XLPE/PVC stranded copper conductor cable, 600/1000V grade, black, 300m length For Crude Oil Tanks / 160m Long for Fire Water Tanks

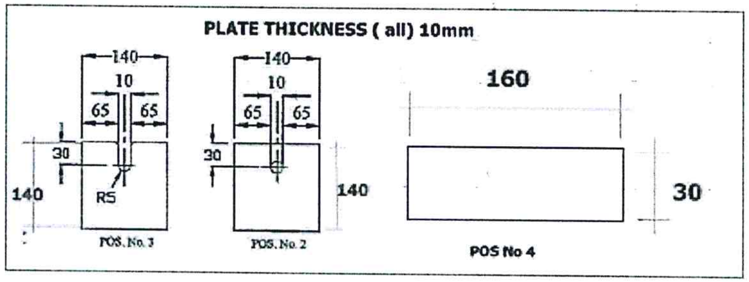
Quantity : 783 No for Crude Oil Storage Tanks
42 No for Fire Water Tanks

BAC®
CORROSION CONTROL

BAC Corrosion Control Ltd
Stafford Park 11 · Telford · TF3 3AY
United Kingdom

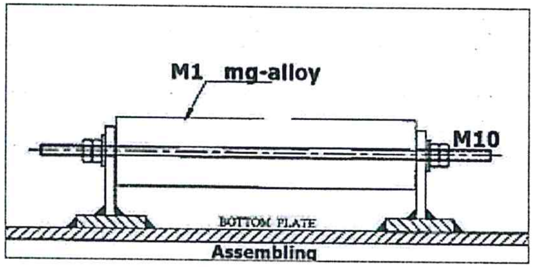
T: +44 (0) 1952 290 321
E: sales@bacgroup.com
W: www.bacgroup.com





ALLOY COMPONENTS

Cu	0.08	MAX
Al	5.3 — 6.7	
Si	0.3	MAX
Fe	0.005	MAX
Mn	0.25	Min
Ni	0.03	MAX
Zn	2.5—3.5	
Pb	0.03 MAX	
Mg	Remainder	



BAC®

CORROSION CONTROL

170 Series Digital Multimeters

Versatile meters for field service or bench repair

These meters have the features needed to find most electrical, electro-mechanical and heating and ventilation problems. They are simple to use and have significant improvements over Fluke's original 70 Series like, True-RMS, more measurement functions, conformance to the latest safety standards, and a much larger display that's easier to view.



Fluke 179



Fluke 177



Fluke 175

Lifetime Warranty!

CAT III 1000V CAT IV 600V

On all Inputs

LISTED UL · CSA · TÜV PRODUCT SERVICE GS · VDE · True RMS

Features

	175	177	179
True-RMS measurements	AC	AC	AC
Digital display counts, updates 4 times per second	6000	6000	6000
Display backlight		●	●
Analog bargraph / segments, updates 40 times per second	33-segments	33-segments	33-segments
Auto and Manual ranging	●	●	●
Display Hold and AutoHOLD®	●	●	●
Min-Max-Average recording mode with Min/Max Alert	●	●	●
Temperature readings (bead thermocouple probe included)			●
Smoothing mode allows filtering of rapidly changing inputs	●	●	●
Audible continuity and diode test	●	●	●
Test lead alert	●	●	●
Unsafe voltage alert warns for voltages above 30V	●	●	●
Low battery indication	●	●	●
Ergonomic case with integrated holster	●	●	●
Easy battery and fuse exchange without opening the complete case	●	●	●
Selectable sleep mode preserves battery life	●	●	●

Specifications

(Check the Fluke web for detailed specifications)

Functions	Maximum	Max. resolution	175	177	179
Voltage DC	1000V	0.1mV	±(0.15%+2)	±(0.09%+2)	±(0.09%+2)
Voltage AC	1000V	0.1mV	±(1.0%+3)	±(1.0%+3)	±(1.0%+3)
Current DC	10A	0.01mA	±(1.0%+3)	±(1.0%+3)	±(1.0%+3)
Current AC	10A	0.01mA	±(1.5%+3)	±(1.5%+3)	±(1.5%+3)
Resistance	50MΩ	0.1Ω	±(0.9%+1)	±(0.9%+1)	±(0.9%+1)
Capacitance	10000µF	1nF	±(1.2%+2)	±(1.2%+2)	±(1.2%+2)
Frequency	100kHz	0.01Hz	±(0.1%+1)	±(0.1%+1)	±(0.1%+1)
Temperature	-40°C/+400°C	0.1°C			±(1.0%+10)

Accuracies are best accuracies for each function

Battery Life: Alkaline, 200 hrs typical
Size (HxWxD): 190 mm x 85 mm x 45 mm

Weight: 0.42 kg
Lifetime Warranty

Included Accessories

Test leads with 4 mm lantern tips and protective cap, installed 9V battery and users manual. The 179 also includes the 80BK temperature probe.

Ordering Information

Fluke 175	True RMS Multimeter
Fluke 177	True RMS Multimeter
Fluke 179	True RMS Multimeter
Fluke 179/EDA2 Kit	Electronics Combo Kit
Fluke 179/MAG2 Kit	Industrial Combo Kit

10342-eng Rev. 08

Recommended Accessories



1400



C90



TLK-220



SV225



1410-11010

CABLE
XLPE/PVC TYPE

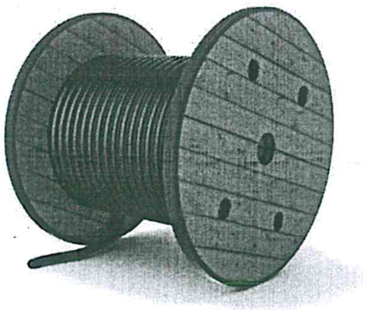
DATASHEET 1.31

CABLE

BAC Corrosion Control Ltd supply a wide range of cables for Cathodic Protection systems.

We can advise you on the correct cable to use for your application and can cater for minimum order quantities, custom markings and insulation colour as required.

Our standard range of XLPE/PVC Cables are detailed as follows :



Quantity :
25,250m of 16mm² XLPE/PVC, Black
50,500m of 50mm² XLPE/PVC, Black

Conductor Size mm²	Number of Strands	Nom O.D. (mm)	Approx Nett Weight (kg/km)
6	7	6.7	99
10	7	8.0	155
16	7	9.1	225
25	7	11.2	340
35	19	12.4	445
50	19	14.7	595
70	19	16.5	810
95	19	19.0	1110
120	37	20.6	1340

- **Insulation:** XLPE (Cross Linked Polyethylene) - Cross-linked polyethylene is a compound form of PE, which enhances the mechanical stability
- **Sheath:** PVC - is available in many compound forms but those used in cable manufacture are plasticized to allow extrusion techniques and subsequent flexibility. It has good ageing and mechanical properties. Can be supplied in Black or Red as standard.
- **Conductor:** Stranded or Solid Plain Annealed Copper.
- **Application:** Designed for use in cathodic protection systems. These cables are provided with PVC sheath for protection and are therefore suitable for external use and direct burial.
- **Technical Data:** Voltage: 600/1000V,
- **Temperature Range:** 20°C to +70°C
- **Relevant Standards:** Conductor: To BS6360 up to 35 mm2 To BS6346 above 50 mm2
- **Sizes and Dimensions**
  All sizes and dimensions are approximate and for information only. BAC will confirm actual dimensions at time of order if required:

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Stafford Park 11 · Telford · TF3 3AY
United Kingdom

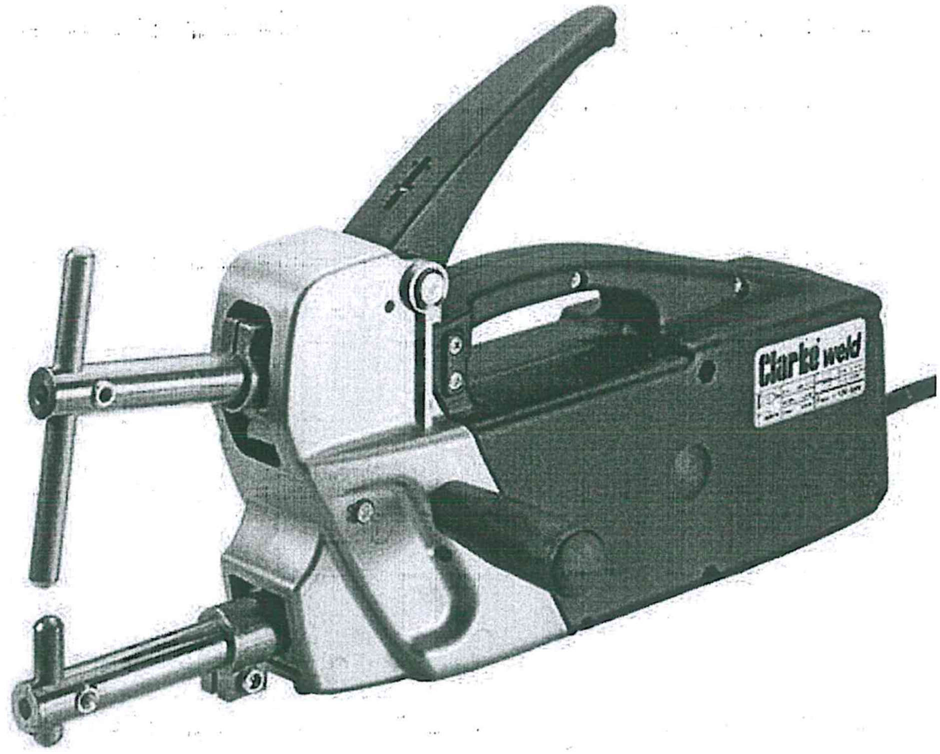
T: +44 (0) 1952 290 321
E: sales@bacgroup.com
W: www.bacgroup.com

MIXED METAL OXIDE ANODES RIBBON TYPE SPOT WELDER

DATASHEET 1.11

SPOT WELDER

A portable spot welding kit that allows quick and easy connections between the MMO/Ti Tibbon Anode and Titanium Conductor Bar.



Quantity : 65 No

TECHNICAL SPECIFICATIONS	
Max. Welding Thickness (mm)	1+1
Input Voltage	230 V
Dimensions	440x110x185 mm
Rated Power	1.2 kW
Max. Absorbed Power	6 kW

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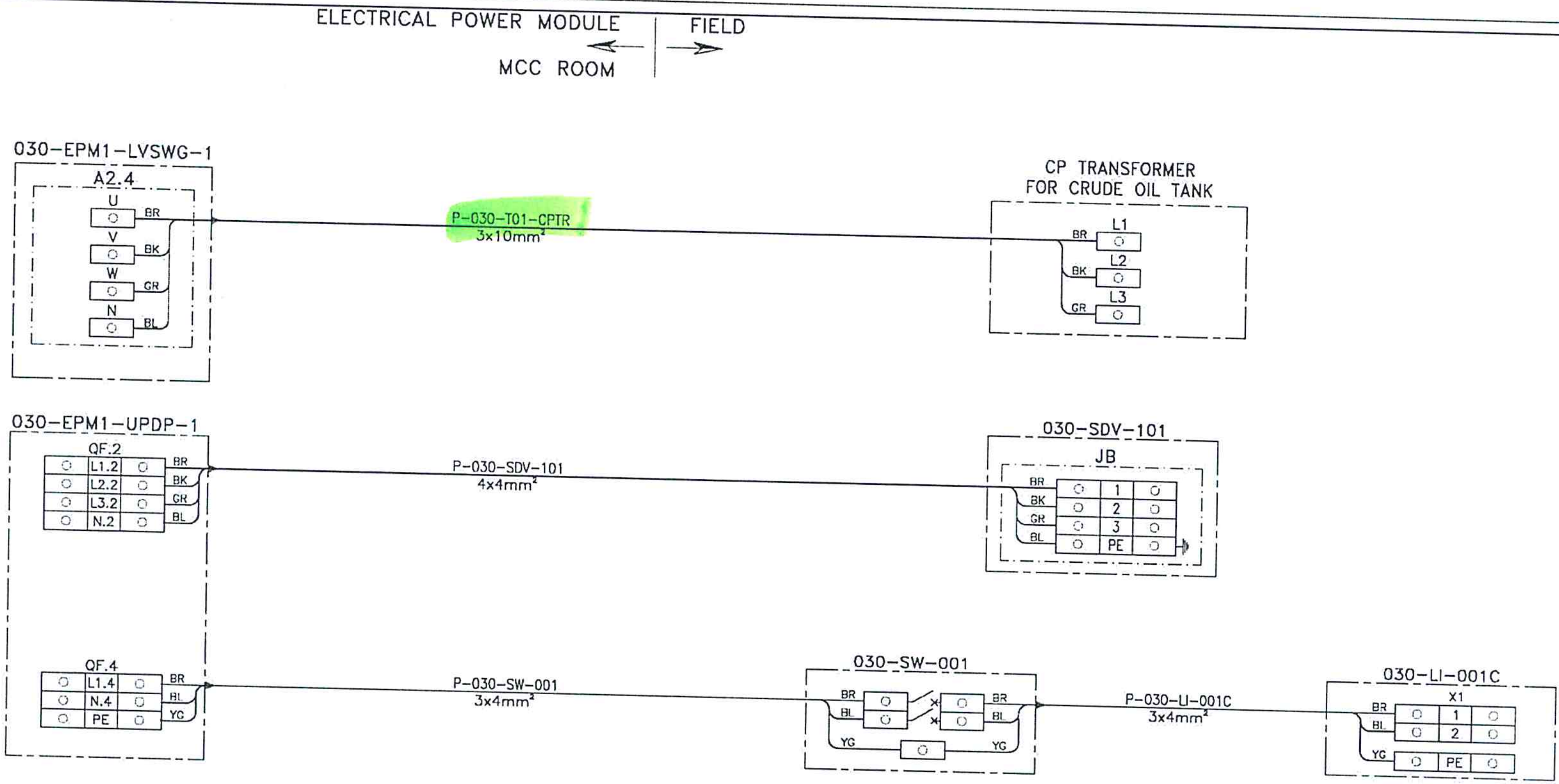
System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.03- Motor Datasheets

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.04- Electrical Cables Schedule

GE+A1:L	Cable Mark	GL1	FROM	TO	GL2	CABLEService	Service Voltage	KW	Size	Type	L
46	P-030-T01-CPTR	WP	030-EPM1-LVSWG-1 (A2.4)	CP Transformer for Crude Oil Tank	WP	3PH POWER FEEDER	400VAC	15	3x10	3C	130



EGPC
THE EGYPTIAN GENERAL PETROLEUM CO.
الهيئة العامة المصرية للبترول
EGPC

FOR : THE EGYPTIAN GENERAL PETROLEUM CORPORATION (EGPC) — لاجل الهيئة العامة المصرية للبترول

AT : AGROOD — الموقع :عجرود السويس

EGPC CRUDE OIL TANK FARM
AGROOD AREA (MODULE-1)
ELECTRICAL INTERCONNECTION & WIRING DIAGRAM
TANK-1 AUXILIARIES
(030-T-01)

الشركة الهندسية للصناعات البترولية والكيماوية
Enppi إنبي
ENGINEERING FOR THE PETROLEUM AND PROCESS INDUSTRIES

SCALE	DOCUMENT NUMBER	SHEET	REVISION
NONE	01251-100-030-EWI-001	053 OF 078	0

A3 SIZE: 297 X 420

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.05- Electrical Cables Laying Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.06- Electrical Cables Testing Certificates

Enppi PETROJET	EGPC CRUDE OIL TANK FARM	EGPC

INSPECTION AND TEST REPORT FOR

CABLE INSULATION RESISTANCE TEST

INSPECTION REPORT NUMBER RFI- 262	INSPECTION DATE & TIME	DOUCUMENT No. ITR-EL-0006A	DISPLINE ELECTRICAL	SYSTEM NO.: / SHEET NO
INSTRUMENT TYPE:	SERIAL:	SERVICE VOLTAGE: 220 v	TEST VOLTAGE: 1kv	AREA / PACKAGE:

NO	Item/Tag NO.	CABLE SIZE	Continuity Test	PHASE TO PHASE "M.Ohm"			PHASE TO NUETRAL "M.Ohm"			PHASES & NUETRAL TO ARMOR "M.Ohm"				RESULT	
				BR-BK	BR-GR	BK-GR	BR-B	BK-B	GR-B	BR-ARM	BK-ARM	GR-ARM	B-ARM	Pass	FAIL
1	P-030-SUB-ACUPS-1A	3.5x120	✓											✓	
2	P-030-SUB-ACUPS-1B	3.5x120	✓											✓	
3	P-030-SUB-ACUPS-BP	3.5x50	✓											✓	
4	C-030-SUB-PC-1	3x2.5	✓					O.K						✓	
5	P-030-Tol-CPTR	3x10	✓											✓	
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															

Remarks :-

Referance :-

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE	[signature]	® Islam Sherif [signature]	[signature]
DATE			

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.07- Electrical Cables Termination Certificates

EGPC CRUDE OIL TANK FARM
AGROOD AREA (MODULE 1 &2)

Owner :	Egyptian General Petroleum Corporation (EGPC)	Project No: 01251-100-030 :01251-100-031
Contractor	CONSORTIUM (ENPPI / PETROJET)	Document No: ITR-QC-0001 Revision No. : 00

REQUEST FOR INSPECTION

ACTIVITY : MMO RIBBON & CONDUCTOR BAR .

NOTIFICATION NO. : PTJ-ELE-RFI-008 DISCIPLINE : CATHODIC PROTECTION

DATE : 1-6-2020

NO.	DESCRIPTION	LOCATION	DATE / TIME	INSPECTION		REMARKS
				PETROJET	ENPPI	
	MMO RIBBON & CONDUCTOR BAR .	030-T-01	1-6-2020	(A)	(A)	

NOTE:

PETROJET		ENPPI
NAME : Mostafa ibrahim	Islam Galal	NAME A. ElBerady
SIGNATURE [signature]	[signature]	SIGNATURE [signature]
DATE 1-6-2020	1/6/20	DATE 1/6/20

EGPC
Enppi

EGPC CRUDE OIL TANK FARM AGROOD AREA
(MODULE 1 &2)

PETROJET
The Petroleum Projects and Technical Consultations Co.
One of the Egyptian General Petroleum Corporation Companies

INSPECTION AND TEST REPORT FOR

MMO RIBBON & CONDUCTOR BAR .

INSPECTION REPORT NUMBER	INSPECTION DATE & TIME	DOUCUMENT No.	DISCIPLINE	SHEET NO
PTJ-ELE-RFI-008		ITR-CP-0001	ELECTRICAL	1 OF 1

JOB DESCRIPTION	AREA DESCRIPTION
EXTERNAL CATHODIC PROTECTION SYSTEM FOR CRUDE OIL TANK	

ITEM / TAG NO.	DRAWING NO.	LOCATION
030-T-01-CP	1251-100-116-02-XX-D99-022	AGROUD AREA - MODULE 01

NO.	INSPECTION	RESULT		
		ACCEPT	REJECT	N/A.
1	Anode installation area free from metallic debris prior to installation and level	✓		
2	Anode visually inspected for damage prior to installation	✓		
3	MMO Ribbon installed as relevant drawing	✓		
4	Conductor Bar installed as relevant drawing	✓		
5	Continuity test shall be conducted between Conductor bar and MMO anode prior to backfilling	✓		
6	All spot welding at crossing locations visually inspected and checked	✓		
7	Power feed connectors installed at correct locations as relevant drawing	✓		
8	Power feed cables have no physical damage with sufficient slack cable to permit exit from ring beam and termination in junction box	✓		
9	Continuity test shall be conducted for all Power feed cables before and after backfilling.	✓		
10	No Interference or contact with the tank external surfaces	✓		
11	Cable routing	✓		
12	Carefully backfill sand over anode to required depth under the tank which is free from rocks, boulders and metallic debris	✓		
13	Output current measurement at power feed cables			✓
14	Waste materials removed from site	✓		

REMARKS:

	PETROJET		ENPPI
NAME :	Mostafa ibrahim	Islam Galalah	A. ElBorady
SIGNATURE	[signature]	[signature]	[signature]
DATE	1-6-2020	1-6-20	1/6/20

Enppi PETROJET

EGPC CRUDE OIL TANK FARM AGROOD AREA (MODULE 1 &2)

EGPC

Owner :	Egyptian General Petroleum Corporation (EGPC)	Project No: 01251-100-030 :01251-100-031
Contractor	CONSORTIUM (ENPPI / PETROJET)	Document No: ITR-QC-0001 Revision No. : 00

REQUEST FOR INSPECTION

ACTIVITY : PERMANENT REFERENCE ELECTRODE & MONITORING PIPE

NOTIFICATION NO. : PTJ-ELE-RFI-014 DISCIPLINE : CATHODIC PROTECTION

DATE : 18/6/2020

NO.	DESCRIPTION	LOCATION	DATE / TIME	INSPECTION			REMARKS
				PETROJET	ENPPI	PMC	
	PERMANENT REFERENCE ELECTRODE & MONITORING PIPE	030-T-01	18-Jun-20	A	A	A	

NOTE:

Inspection result : A - Approved B - Reject C - Approved with Comment

	PETROJET	ENPPI	PMC
NAME :	Mostafa ibrahim	Ayman Bakeir	د/ محمد ابراهيم محمد
SIGNATURE	[signature]	[signature]	[signature]
DATE	18-6-2020.	18-06-2020	٢٠٢٠/٦/١٨

EGPC Enppi

EGPC CRUDE OIL TANK FARM AGROOD AREA (MODULE 1 &2)

PETROJET
The Petroleum Projects and Technical Consultations Co.
One of the Egyptian General Petroleum Corporation Companies

INSPECTION AND TEST REPORT FOR

PERMANENT REFERENCE ELECTRODE & MONITORING PIPE

INSPECTION REPORT NUMBER	INSPECTION DATE & TIME	DOUCUMENT No.	DISCIPLINE	SHEET NO
		ITR-CP-0002	ELECTRICAL	1 OF 1

JOB DESCRIPTION	AREA DESCRIPTION
CATHODIC PROTECTION SYSTEM	030-T-01

ITEM / TAG NO.	DRAWING NO.	LOCATION
030-T-01-CP	1251-100-116-02-XX-D99-023	AGROUD AREA MODULE 01

NO.	INSPECTION	RESULT		
		ACCEPT	REJECT	N/A.
1	RE visually inspected for damage and tested prior to installation	✓		
2	Location of reference electrode correct	✓		
3	Location of monitoring tube correct	✓		
4	Reference electrode calibration test – measure potential to a calibrated portable CSE RE immersed in fresh water along with the permanent RE to be tested.			✓
5	Elevation of reference electrode (m) as relevant drawing	✓		
6	Monitoring tube installed straight and free from inside obstructions	✓		
7	Reference electrode quantity as relevant drawing	✓		
8	Reference electrode spacing	✓		
9	Carefully selected backfill installed around anode which is free from rocks, boulders and metallic debris	✓		
10	Structure-to-electrolyte potential recorded with the permanent reference electrode			✓
11	Cables have no physical damage with sufficient slack cable to permit removal of terminated cables from terminals	✓		
12	Reinstatement completed and waste materials removed from site	✓		

REMARKS:

	PETROJET	ENPPI	PMC
NAME :	Mostafa ibrahim	Ayman Bakeir	م / محمد ابراهيم محمد
SIGNATURE	[signature]	[signature]	[signature]
DATE	18-6-2020	18-06-2020	٢٠٢٠/٦/١٨

0

Enppi PETROJET

EGPC CRUDE OIL TANK FARM

EGPC

Owner :	Egyptian General Petroleum Corporation (EGPC)	Project No: 01251-100-030 :01251-100-031
Contractor	CONSORTIUM (ENPPI / PETROJET)	Document No: ITR-QC-0001 Revision No. : 00

REQUEST FOR INSPECTION

ACTIVITY : CABLE TERMINATION AND SPLICING

NOTIFICATION NO. : PTJ-ELEC-RFI- 262 DISCIPLINE : E&I

DATE : 10/23/2021

NO.	DESCRIPTION	LOCATION	DATE / TIME	INSPECTION			REMARKS
				PETROJET	ENPPI	PMC	
	CABLE TERMINATION AND SPLICING	MODULE 1	23-Oct-21				
1	P-030-SUB-ACUPS-1A						
2	P-030-SUB-ACUPS-1B						
3	P-030-SUB-ACUPS-BP						
4	C-030-SUB-PC-1						
5	P-030-T01-CPTR						
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							

NOTE:

Inspection result : A - Approved B - Reject C - Approved with Comment

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE	[signature]	Ⓡ Islam Sherif [signature]	[signature]
DATE			

Enppi PETROJET

EGPC CRUDE OIL TANK FARM

EGPC

INSPECTION AND TEST REPORT FOR

CABLE TERMINATION AND SPLICING

INSPECTION REPORT NUMBER	INSPECTION DATE & TIME	ITR NUMBER	SYSTEM NO.: DISPLINE	SHEET NO
262		ITR-EL-0009	ELEC	1 OF 1

Item/Tag NO.					
Type :-		Core:		Size:	

NO.	Description of check	RESUNT		
		ACCEPT	REJECT	N/A.
1	Check cable glands are correct type and size as per cable schedule.	✓		
2	Check there are no damages to cores, termination chamber layout is satisfactory, core identification is correct, crimped and pins satisfactory.	✓		
3	Check cable tag is done correctly.	✓		
4	Test and confirm conductor, phase continuity.	✓		
5	Check insulation resistance test (megger) is completed *'	✓		
6	Check Hi-pot test is completed, only for MV/HV cables *''			✓
7	Connect all cores at both ends and confirm all connections are correct as per termination diagram.	✓		
8	Confirm spare cores, screens are earthed and conform to design drawings/specifications	✓		
9	Check enclosure cover is installed , no damages and no bolts are missing	✓		
10	Calibration test certificate of testing equipment to be checked.			✓

Remarks :

....

....

....

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE	Sobh [signature]	Islam Sherif [stamp/signature]	[signature]
DATE			

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.08- FAT Reports & Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.09- SAT Reports & Certificates

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.10- Electrical Pre-Commissioning Check Lists

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

12.11- Electrical Supplier Check Lists & Reports

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

13- Electrical Commissioning

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

13.01- Electrical -Commissioning Check Lists

PROJECT	EGPC STORAGE TANKS
LOCATION	AGROOD
CLIENT	PMC
SUPPLIER	PETROJET
MANUFACTURE	BAC .
TANK SERVICE	TANK 30-TK-01

Pre-Commissioning Check Sheet for Transformer Rectifier Unit		
CHECK LIST		TEST / CHECK REPORT
Transformer Rectifier Unit / Location		OUTSIDE BUND WALL
Rectifier Manufacturer		BAC
Rectifier Type / Serial Number		OIL COOLD
Rectifier Rating	AC Input	3 PHASE
	DC Output	50 A /150 A
All Cables (AC / DC) are properly terminated identified with proper tagging		OK
Transformer Rectifier is properly grounded to the earthing system.		OK
Oil Gauge, Silica Gel Breather & Fuse are properly fixed and secured without any damages.		OK
T/R Unit is filled with suitable type of cooling oil at the required level.		OK
Confirm TRU enclosure is earthed properly		OK
Remarks		

	COMPLETED BY	WITNESSED BY
Company	*PETROJET*	PMC
Name	Eng. Mostafa Ibrahim	Eng. Mohamed Ibrahim
Signature	27/7/2021	
Date	27/7/2021	

PROJECT	EGPC STORAGE TANKS
LOCATION	AGROOD
CLIENT	PMC
SUPPLIER	PETROJET
MANUFACTURE	BAC .
TANK SERVICE	TANK 30-TK-01

Pre-Commissioning Check Sheet For Junction Boxes (Anode Junction Boxes)

CHECK LIST	TEST / CHECK REPORT
Confirm Location	Outside Bund Wall
Physical Condition (Internally & Externally)	OK
Number of Circuits	17
Junction box is properly mounted and secured on the frame	OK
All cables are properly terminated inside the junction box unit	OK
Remarks	17 circuits divided into 2 anode junction boxes: - - 10 and 7

	COMPLETED BY	WITNESSED BY
Company	*PETROJET*	PMC
Name	Eng. Mostafa Ibrahim	Eng. Mohamed Ibrahim
Signature	27/7/2021	
Date	27/7/2021	

PROJECT	EGPC STORAGE TANKS
LOCATION	AGROOD
CLIENT	PMC
SUPPLIER	PETROJET
MANUFACTURE	BAC .
TANK SERVICE	TANK 30-TK-01

Pre-Commissioning Check Sheet for Test Posts (Galvanized Steel Type)

CHECK LIST	TEST / CHECK REPORT
Test Post Location	Outside Bund Wall
Number of Cables Terminated	23
Physical Condition (Internally & Externally)	OK
Test Post is properly mounted and secured on the test post conduit.	OK
All cables are properly terminated inside the big fink.	OK
Remarks	23 circuits divided into 5 test points 4 TP.1 – 5 TP.2 - 5 TP.3 - 5 TP.4 - 4 TP.5

	COMPLETED BY	WITNESSED BY
Company	*PETROJET*	PMC
Name	Eng. Mostafa Ibrahim	Eng. Mohamed Ibrahim
Signature	27/7/2021	
Date	27/7/2021	

PROJECT	EGPC STORAGE TANKS
LOCATION	AGROOD
CLIENT	PMC
SUPPLIER	PETROJET
MANUFACTURE	BAC .
TANK SERVICE	TANK 30-TK-01

Commissioning Check Sheet for Transformer Rectifier Unit

Location : Agrood	Parameter Settings		
	Rated AC Input	400(V) /50 Hz	
	Rated DC Output	50 (V)	150 (A)
Control Parameters	Adjusted		
DC Output Voltage	2.3 (V)		
DC Output Current	1.2 (A)		
Overall Circuit Resistance	2 OHM		
REMARKS:			

	COMPLETED BY	WITNESSED BY
Company	*PETROJET*	PMC
Name	Eng. Mostafa Ibrahim	Eng. Mohamed Ibrahim
Signature	[signature] 27/7/2021	[signature]
Date	27/7/2021	

PROJECT	EGPC STORAGE TANKS
OWNER	PMC
SUPPLIER	PETROJET
MANUFACTURE	BAC
TANK SERVICE	Crude Oil Storage TANK 30-TK-01

Commissioning Check Sheet For Structure-To-Soil Potential Measurement (Test Post Location)

Test Post location

TEST NO.	TEST FACILITY		POTENTIAL	REMARKS
	TYPE	Location	ON - POTENTIAL V	
1	GALVANIZED STEEL	OUTSIDE BUND WALL	- 1.14 / - 1.2 / -1.3 / -1	Accept
2	GALVANIZED STEEL	OUTSIDE BUND WALL	-1.1 / -1.3 / -1.2 / -1.3 / -1	Accept
3	GALVANIZED STEEL	OUTSIDE BUND WALL	-1.1 / -1.2 / -1.1 / -1.2 / -1.3	Accept
4	GALVANIZED STEEL	OUTSIDE BUND WALL	-1 / -1.3 / -1.2 / -1.2 / -0.95	Accept
5	GALVANIZED STEEL	OUTSIDE BUND WALL	-0.97 / -1.2 / - 1/ - 1.3	Accept

Reference Electrode (Type): CU/CUSO4

General Notes:

	COMPLETED BY	WITNESSED BY
Company	*PETROJET*	PMC
Name	Eng. Mostafa Ibrahim	Eng. Mohamed Ibrahim
Signature	27/7/2021	[signature]
Date	27/7/2021	

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

13.02- Electrical Supplier Check Lists & Reports

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

14- Red Marked-up Drawings

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

14.01- P&ID

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

14.02- Instrumentation Drawings

System ID	030-CP-002
System Description	Tank-01 Cathodic Protection System

14.03- Electrical Drawings